Volume XIX.
Number 1.

JULY, 1900.

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"Knit Goods at Paris Exposition."

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OF

VOLUME XIX

OF

THE TEXTILE WORLD

COMPRISING

JULY—DECEMBER, 1900 (Inclusive.)

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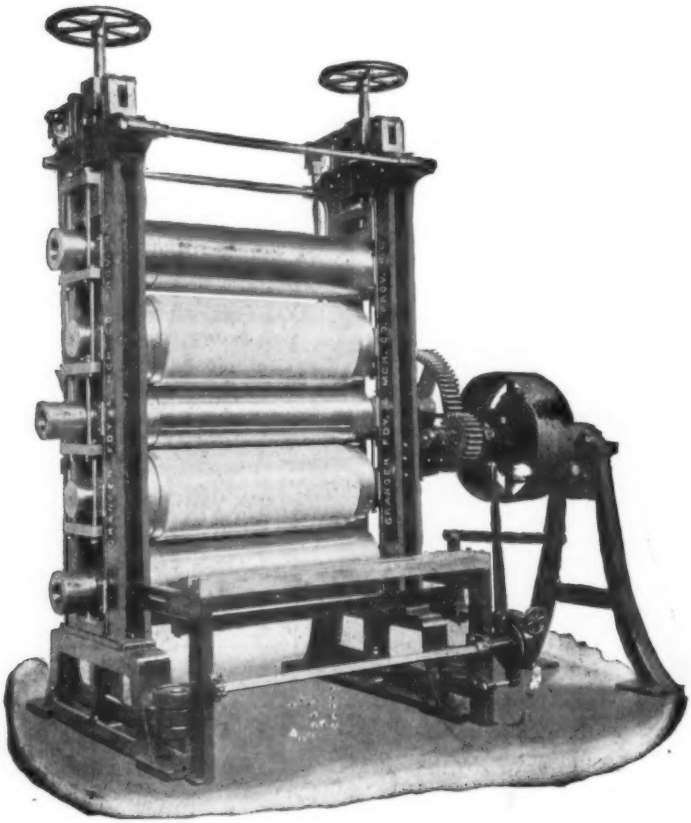

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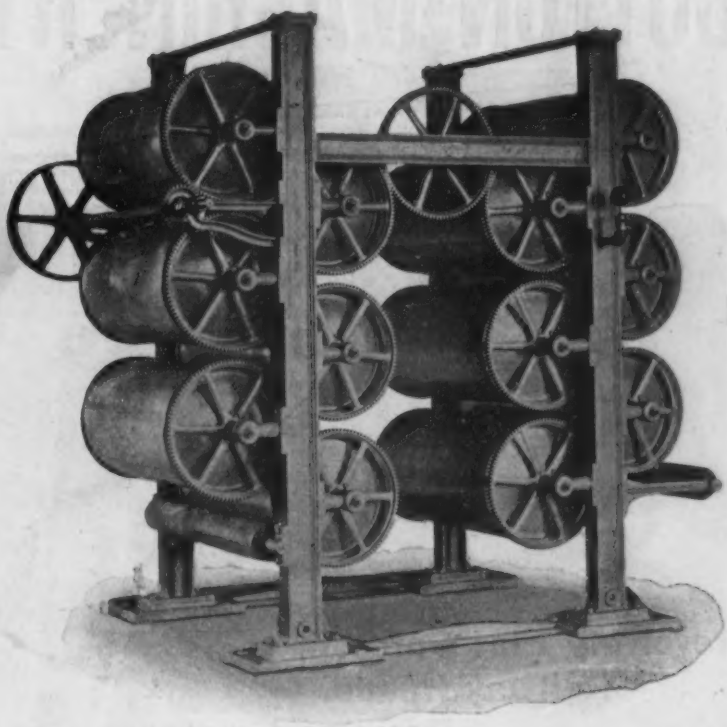

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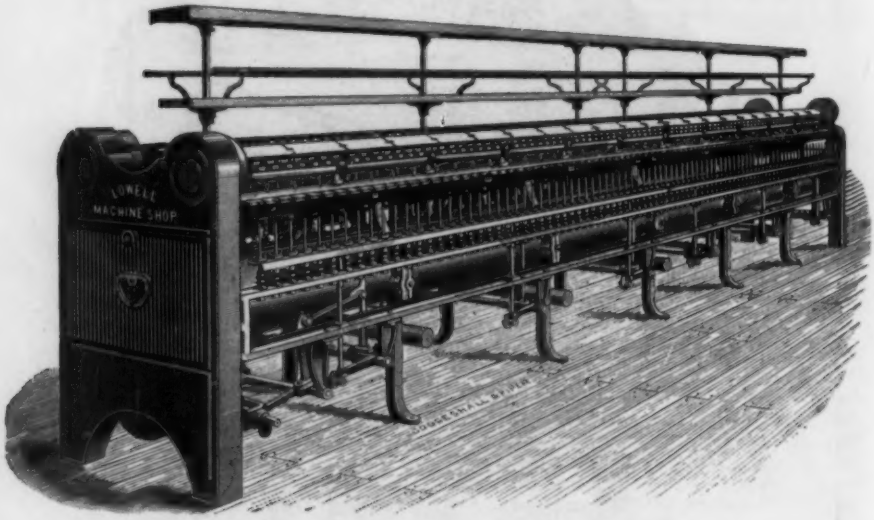

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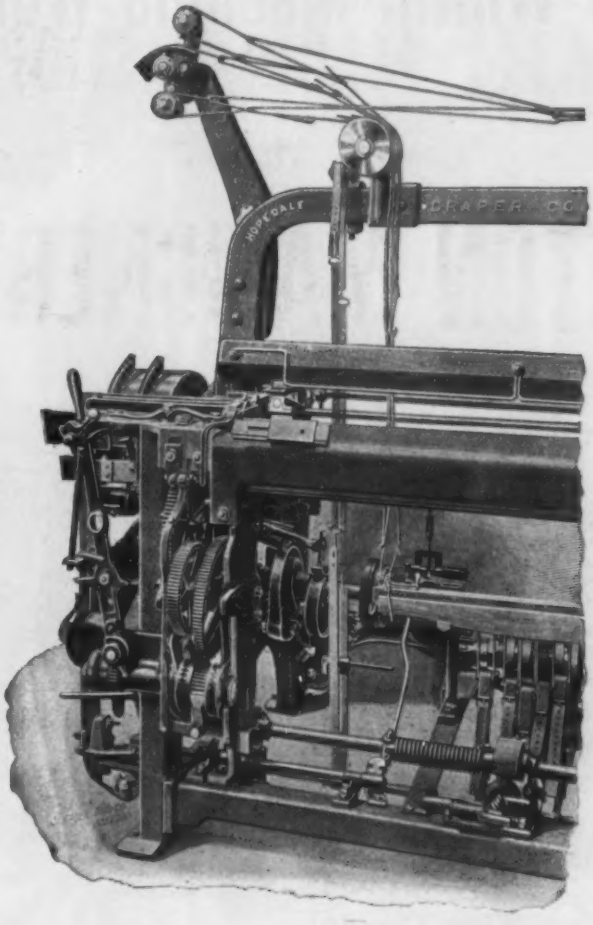

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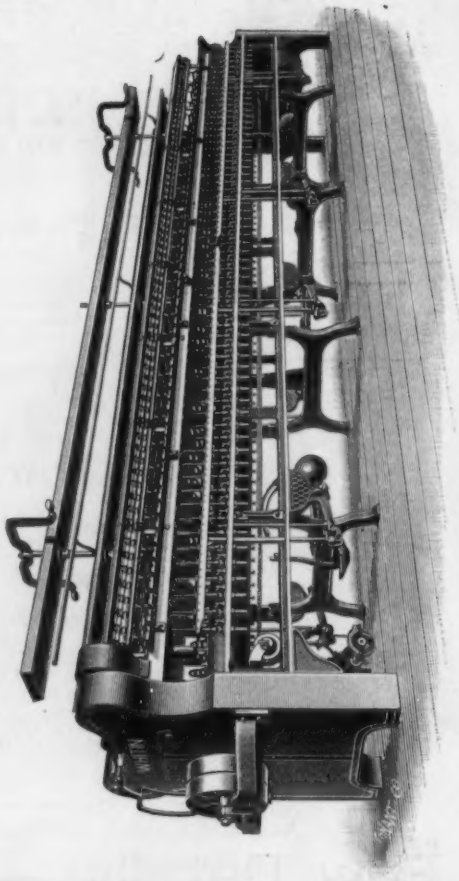

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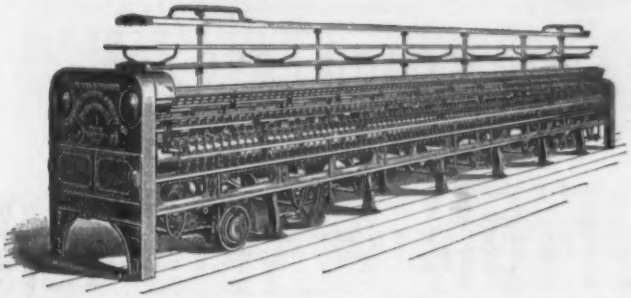

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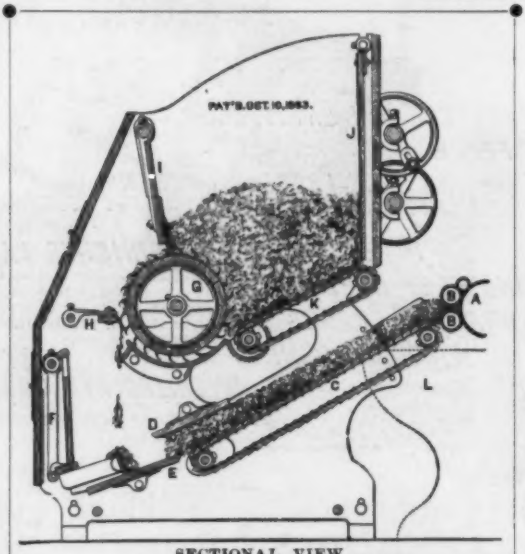

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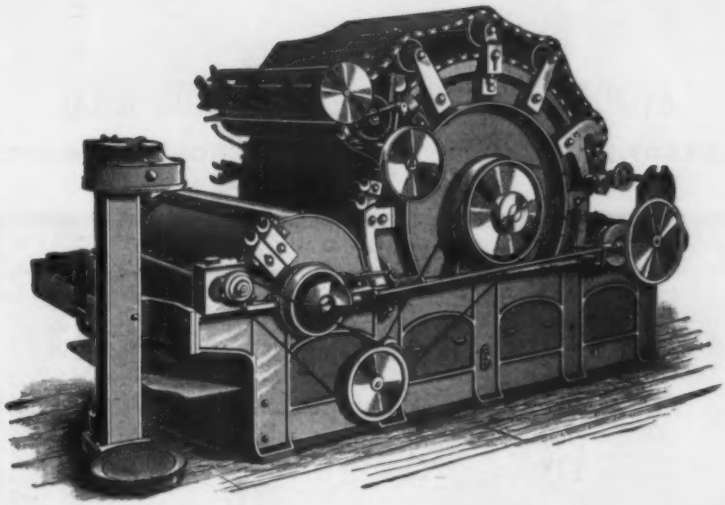

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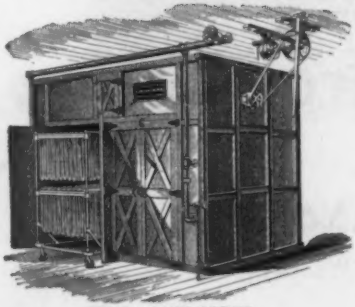

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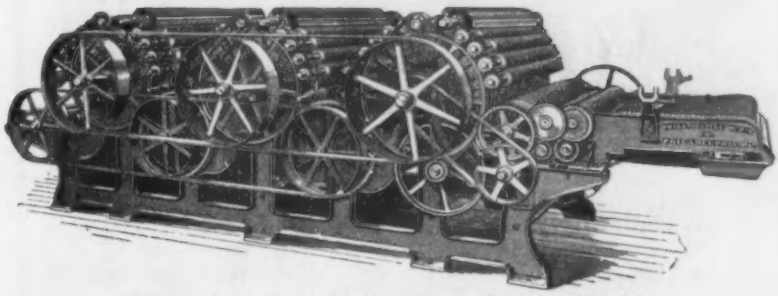

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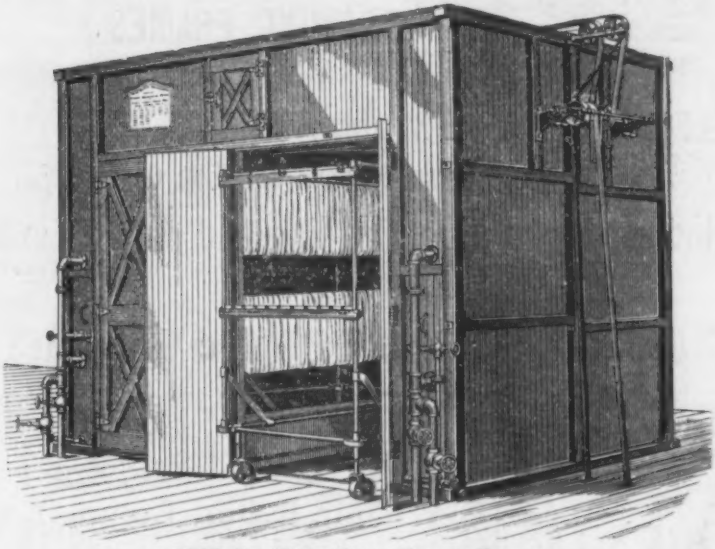

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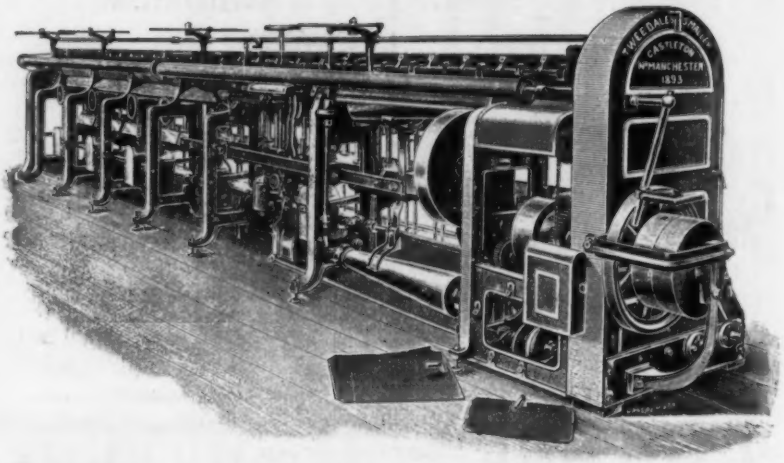

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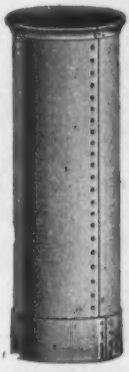

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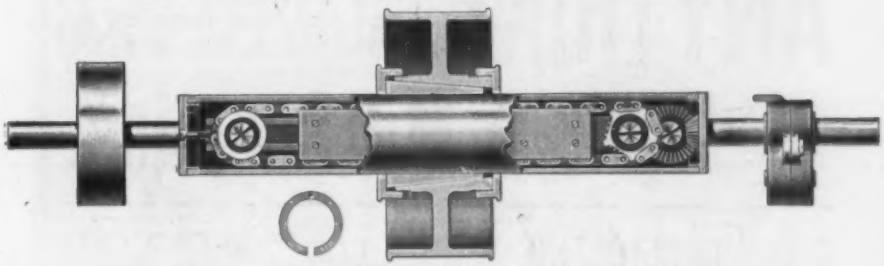

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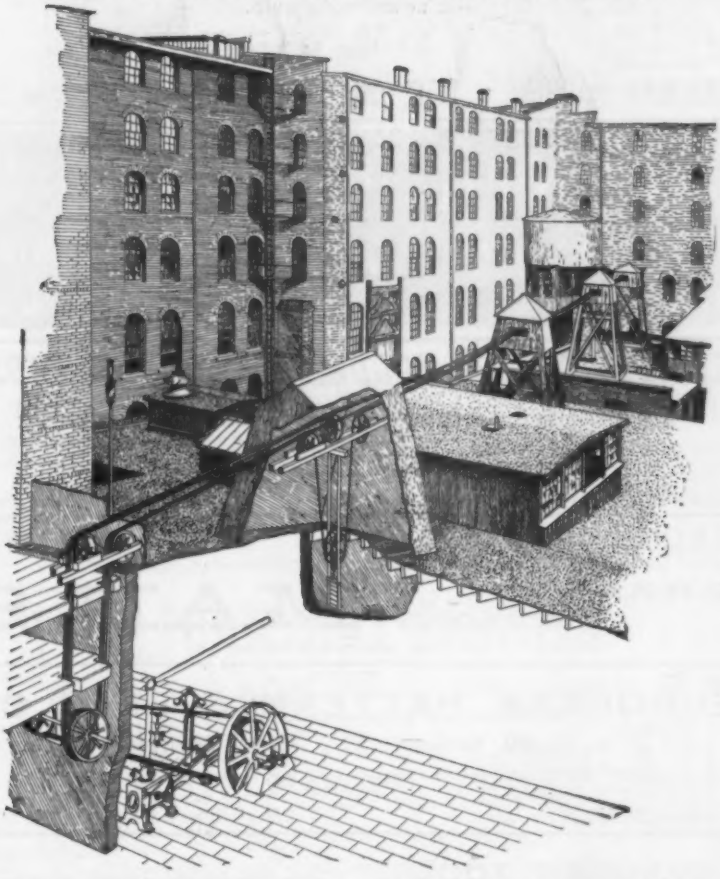

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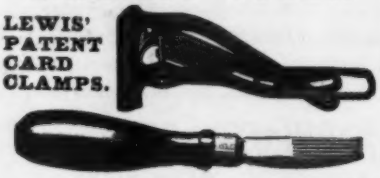

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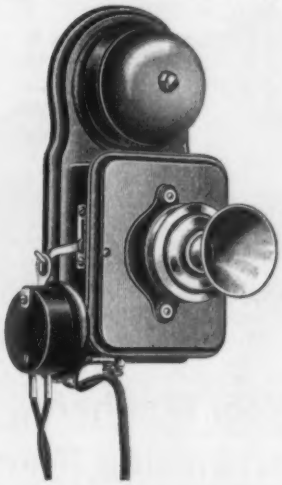

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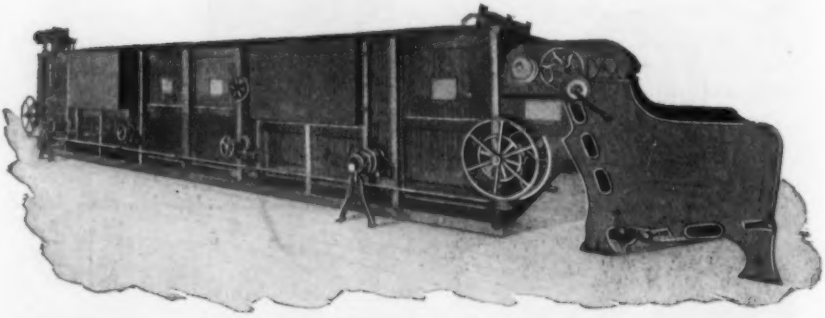

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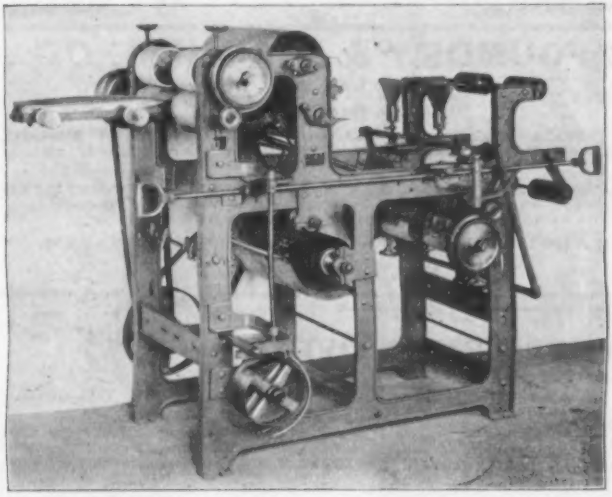

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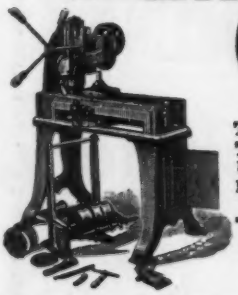

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Patents.

Issued June 5, 12, 19 and 26, 1900.

Bag Holder. 651,756. Wm. J. Harnois, James, S. D.

Bag Holder. 651,773. Beaman C. Smith, Stoneham, Mass.

Centrifugal Machine. 650,958. Carl Stute, Kicklingen, Gy.

Cloth Shearing Machine. 651,113. H. S. Greene, Woonsocket, R. I., assignor to Woonsocket Napping Mchry. Co., same place.

Cloth Shearing Machine. 651,114. Thos. H. Greene, Woonsocket, R. I., assignor to Woonsocket Napping Mchry. Co., same place.

Cotton Cleaner and Feeder. 651,979. John W. Seifert, Waco, Tex.

Cotton Press. 652,393. W. T. Calton, Lattimore, N. C.

Cotton Presses, Compression-belt for. 652,447. M. Swenson, Chicago, Ill., assignor to Am. Cotton Co., New York City.

Cotton Separator, Distributer and Feeder. 651,986. E. E. Bateman, Marquez, Tex.

Dyeing, etc., Apparatus for. 652,435. A. Marr, Manchester, Eng.

Dyeing. 651,599. W. Foster, Newburgh, N. Y.

Fibres, Preparing Vegetable. 650,917. B. S. Summers, Chicago, Ill.

Fibre Machine. 652,708. S. B. Allison, New Orleans, La.

Fibrous Materials, Apparatus for Cleaning, Combing and Assorting. 11,832 (Re-issue). W. S. Archer, Pawtucket, R. I.

Jacquard Machine. 651,572. A. E. Kelmel, Providence, R. I., assignor to the Crompton & Knowles Loom Works, same place.

Jacquard Machine, Double Acting. 651,571. A. E. Kelmel, Providence, R. I., assignor to the Crompton & Knowles Loom Works, Worcester, Mass.

Knitting Machine for Making Open or Lace Work—Circular. 650,874. J. H. Sprowles, Philadelphia, Pa.

PATENTS

CAVEATS, TRADE-MARKS, COPYRIGHTS AND DESIGNS.

30 years experience. Endorsements from Actual Clients furnished on request. Consult references in Washinton-Bradstreet's Agency, the Columbia National Bank and the Lincoln National Bank.

E. G. SIGGERS, National Union Building, 918 F. Street, N. W., Washington, D. C.

Knitting Machine. 652,186. H. A. Klemm, New York City, assignor by mesne assignments to Julius Kayser, same place.

Loom. 652,105 and 652,224. Hy. I. Harriman, New York City.

Loom. 652,222. E. S. Stimpson, Hopedale, Mass., assignor to Draper Co., same place and Portland, Me.

Loom. 651,744. Thomas Caldwell Bolton, and Wm. Caldwell, Leigh, Eng., assignors by mesne assignments, to the Radax Pneumatic Tyre Co., Ltd., Warrington, Eng.

Loom Box-Motion. 651,973. T. G. Moser, Gibsonville, N. C., assignor of one-half to Robt. F. Rice, Greensboro, N. C.

Loom Draw Detecting Mechanism. 651,704. W. G. Eaton, Nashua, N. H., assignor to the Draper Co., Portland, Me., and Hopedale, Mass.

Loom Filling Supplying Mechanism. 651,715 and 651,716. Belonic Janelle, Manchester, N. H., assignor of three-fourths to Herman F. Straw and Hy. E. Parker, same place.

Loom Harness. 652,060. P. A. Wagner, Carlstadt, N. J.

Loom Jacquard Machine. 651,119 and 651,120. A. R. Patten, Providence, R. I., assignor to the Crompton & Knowles Loom Works, same place.

Loom Picker-Staff Connection. 651,759. J. E. Hey and Abraham Hey, Pascoag, R. I.

Loom Let-off Mechanism. Pile Fabric. 651,321. C. Alvord, Worcester, Mass.

Loom Shuttle. 651,604. S. M. Hamblin, Central Falls, R. I.

(Continued on page 110.)

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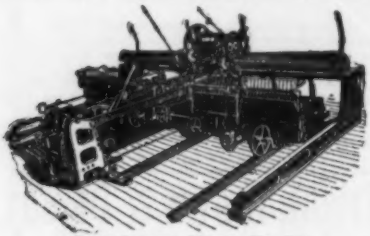

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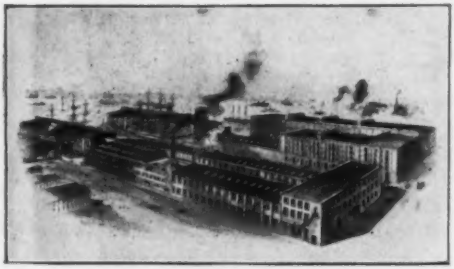

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Chas. Bailey

TEXTILE WORLD.

Vol. XIX. JULY, 1900. No. 1.

CHARLES BAILEY.

Charles Bailey was born on the 9th of March, 1830, in Hanging Heaton, near Batley, Yorkshire, England. There were no influential friends to start him on the easy road to success, and the hard struggle of toilers, working for a bare existence in England, at long hours and small wages, was his only choice. At nine years of age, which was the limit for child labor in mills, fixed by the English Factory Act, Charles began working as a piecer in the spinning room. His education was obtained later in the non-sectarian Sunday schools, which at that time were in nearly every English village, where the children were instructed by volunteer teachers in the elementary branches of education. At twelve years of age, the boy learned hand loom weaving, and three years later, during a period of dulness in the weaving mills, learned his father's trade of shoe-making. He continued, however, to work as a weaver, whenever such work could be secured, and learned to weave and design woolen patterns, working his way up to the position of overseer of a section of looms.

In 1857, at the age of twenty-seven, he came to this country, and settled in Little Falls, N. Y. His American citizenship is, consequently, a matter of choice and not the result of chance, as is the case with the native born citizen. He had been married in England, and had two children, one of whom died on the passage to this country. His first work in the United States was in the Mohawk Mills, where he set up and ran some jacquard looms, and later learned to spin on the hand jack, as he could earn better wages in that way than at weaving. At this time, he began to buy and sell woolen rags, in a small way. In 1860, his wife died, and he was left with two children, in a new country, and with few friends to aid him. He then secured employment in a fork factory, at Fly Creek, Otsego County, where he was in charge of the finishing and shipping departments. He increased his small income at this time by teaching and leading the Fly Creek brass band.

In 1863, he married again, and returned to Little Falls, where he entered into partnership with his brother-in-law, Jeremiah Mitchell, dealing in woolen rags. Later, they removed to Oriskany, N. Y., where they formed a partnership with William Butcher, to manufacture stocking yarn; and, shortly afterwards, they began the manufacture of knit goods. In 1865, their mill was burned to the ground, and they lost every dollar they were worth. With undiminished courage, Mr. Bailey returned to Little Falls, and began again, dealing in rags and manufacturing shoddy.

In 1871, Messrs. Mitchell & Bailey built the first part of what is now the Little Falls Knitting Mill. The original intention was to manufacture beavers, in which branch both Mr. Bailey and his partner had been trained, in England. Before the building was completed, the plan was changed, and a stock company was formed, to operate the mill on knit goods. The firm of Mitchell & Bailey was dissolved, and Mr. Bailey became manager of the new knitting mill, which position he held for twenty-eight years, part of which time he

was president of the company. Under his management, the business prospered, and many additions were made from time to time.

During this period Mr. Bailey gave his undivided attention to the business, and no detail was small enough to escape him. He was always quick to adopt improvements, and was constantly on the alert to keep the mill up-to-date, ready to get up in the middle of the night, if, by so doing, he could discover something new, that would advance the interests of the Little Falls Knitting Mill, which was and is now popularly known as "Bailey's Mill."

In January of the present year, Mr. Bailey disposed of his interest in the Little Falls Knitting Mill, and formed a partnership with his two sons, Squire and Thomas, both of whom had been thoroughly trained in the business. They purchased a large mill at Fort Plain, N. Y., now called the Bailey Knitting Mills, which they are successfully operating at the present time.

Mr. Bailey has been engaged in manufacturing for sixty-one years, rising from the lowest to the highest position in the mill by his own unaided efforts, and is still in the harness. His career teaches many striking lessons to young men who, surrounded with the great advantages of today, in education and business pursuits, are nevertheless apt to think that opportunities for success are all in the past. With no one but himself to rely upon, Charles Bailey has, by industry, thrift and perseverance, amid almost overwhelming discouragements, worked his way to his present position. He is a successful captain of industry, democratic in his tastes and habits, and during the years of his prosperity has never forgotten or despised the "days of small things."

—We call attention to the prize offered for novel ideas or wrinkles in connection with knitting industry, to be found in knitting department.

THE TEXTILE WORLD'S 1900 DIRECTORY.

The Textile World's 1900 Official Directory of Textile Mills, and of Buyers of Textile Fabrics, which has been recently published, is larger by 50 pages than before, having 448 pages and 22 maps. There have been hundreds of new mills added and many thousands of changes made in the mill reports, and with the design of making it still more valuable for manufacturers' and mill men's use, a number of Useful Tables have been included, several of which are published for the first time. The tables include: Comparative Yarn Tables, comparison of yarn standards; Reed Tables, designed on a somewhat different plan than before, and a valuable series of tables for finding the weight of different lengths of yarns of various sizes in a yard of cloth, which will save many long calculations in finding the weight of different fabrics per yard. For the knitting manufacturer the tables of knitting gauges and yarn sizes for knitting machines, sizes of garments, etc., will be found useful.

Entirely new plates have been engraved for the New England States, and all the map plates have been corrected and brought up to date.

The consolidated tables of mill statistics will be appreciated by students of statistics, and extracts from these tables will be found on another page.

Every man connected with the textile trade, whether he is a manufacturer, superintendent, foreman, or in any of the collateral branches, will find this Directory of great value, and no pains or expense have been spared to make it accurate in every particular. Those who have used it commend its system of arrangement as being the most convenient and time-saving.

The manufacturer and mill selling direct find in this Directory what no other textile directory contains; viz., not only a list of manufacturers' selling agents, but the manufacturing clothiers, suit and cloak manufacturers and jobbers and large retailers

buying direct, giving buyers' names for the different classes of goods. Besides these, there is a list of wool and cotton dealers and of wholesale rag and shoddy houses.

The Directory is cross indexed, so that a mill may be found either by referring to the town in which it is located or in the Alphabetical Directory by its own name.

The complete Table of Contents is as follows:

Part 1. Textile establishments of the United States, arranged by states and towns where they are located, with full data about each mill, also maps of the manufacturing states showing towns where there are mills; Alphabetical Index of all the Mills in the United States; List of Mills having Worsted Machinery; List of Wool Scourers for Market; Number of Spindles and Looms in the United States.

Part 2. Manufacturers' Selling Agents and Dry Goods Commission Merchants; Manufacturing Clothiers; Suit and Cloak Manufacturers; Jobbers and Large Buyers from first hands.

Part 3. Wool and Shoddy Dealers and Brokers; Cotton Dealers and Brokers; Wholesale Rag Dealers.

Part 4. Tables for Manufacturers' Use.

Part 5. Buyers' Index of Textile Machinery and Supplies.

The price of the flexibly covered edition is $2.00; cloth bound, $2.50.

THE AMOUNT OF TEXTILE MACHINERY IN THE UNITED STATES IN 1900.

The Textile World has compiled from its 1900 Directory of Textile Establishments, just issued, a summary of the textile machinery in the United States, including the different branches; viz., cotton, woolen, knitting and silk industries. The figures show a remarkable development in comparison with 1890, and the development within the last few years has been especially rapid. The cotton industry now operates a total of 21,057,983 spindles and 490,389 looms. Massachusetts is still in the lead, with 8,012,831 spindles; Rhode Island second, with 2,090,138; South Carolina third, with 1,794,657; North Carolina fourth, 1,499,540; New Hampshire, 1,343,923; Georgia, 1,218,504; Connecticut, 1,040,165. The Southern group of states now operates 5,815,429 spindles, and the Northern mills 15,242,554. In 1890 the South had 1,828,982 spindles and the North 12,721,341. The actual increase in number of spindles in the South in ten years is 3,986,447, a gain of 217 per cent. The actual increase in Northern states is 2,521,213, a gain of 19.8 per cent.

There has been a large increase in the amount of worsted machinery. There are now 1510 worsted combs. In the compilation of woolen and worsted machinery we have not included shoddy cards or worsted sets of cards, as these should not be reckoned as a basis of productive capacity for woolen and worsted mills. Even the set of cards as a basis of figuring woolen machinery capacity is a poor unit, and we understand that in the 1900 census the spinning spindle is to be adopted as basis of capacity, as in other countries. The number of looms gives a very fair idea of the growth of the business, and we estimate that there has been a net gain of about 5000 looms on woolen and worsted goods in the past two years. The total number of sets of woolen cards in woolen mills is 6,539; worsted combs, 1510; woolen and worsted looms, 80,759. There are 1267 sets of woolen cards in knitting mills, making the total number of sets of woolen cards, 7806.

The summary of knitting machinery means little on account of the great

variety of knitting machinery, but gives a basis for comparison in future years, and shows where the knitting industry is located. As might be expected, Pennsylvania has a large lead, having 28,775 knitting machines. New York is second, with 11,299 machines. In the net value of product, New York no doubt equals, and, perhaps, surpasses Pennsylvania, because the character of goods made is largely higher priced underwear, instead of hosiery. Massachusetts is third, with 6313 machines; New Hampshire fourth, with 4146. The Western states show up well with knitting machinery, Illinois having 2311; Indiana, 1194; Michigan, 2841; Ohio, 2141; Tennessee, 873; Wisconsin, 2832. In the Southern group, North Carolina has 1482; South Carolina, 720; Virginia, 753. The total number of knitting ma-

THE COTTON AND SILK MACHINERY STATISTICS OF THE UNITED STATES FOR THE YEAR 1900,

Giving the number of Spindles and Looms in the Cotton and Silk Industries.

STATES.	COTTON.		SILK.	
	Spindles.	Looms.	Spindles.	Looms.
Alabama	490,958	10,984	....	....
Arkansas	17,160	299	....	....
California	10,000	200	1,500	....
Colorado	19,000	484	....	....
Connecticut	1,040,165	21,265	88,976	1,322
Delaware	35,000	838	....	300
Georgia	1,218,504	26,033	....	....
Illinois	38,000	808	....	167
Indiana	101,500	2,284	....	....
Kansas	2,000	...	....	....
Kentucky	44,656	991	....	....
Louisiana	78,222	4,110	....	....
Maine	862,139	23,150	....	125
Maryland	154,784	3,146	....	51
Massachusetts	8,012,831	182,683	17,000	868
Michigan	....	...	3,700	225
Mississippi	131,360	3,821	....	....
Missouri	13,904	356	....	....
Nebraska	15,488	416	....	....
New Hampshire	1,343,923	34,919	4,000	....
New Jersey	385,004	2,281	343,219	23,984
New York	737,047	15,292	255,148	5,414
North Carolina	1,499,540	34,732	30,000	1,450
Ohio	19,200	98	....	26
Philadelphia	....	....	....	....
Pennsylvania	384,173	16,331	650,742	13,810
Rhode Island	2,090,138	43,691	1,960	110
South Carolina	1,794,657	47,725	....	....
Tennessee	172,213	3,327	....	....
Texas	50,924	1,066	....	....
Utah	450	...	....	4
Vermont	118,912	2,538	....	40
Virginia	148,547	5,436	30,000	350
West Virginia	....	23	....	....
Wisconsin	32,584	1,071	....	....
Totals	21,057,983	490,398	†1,426,245	*48,246

* The silk loom figures do not include braiders, of which there are about 15,000, and knitters, about 1,300.

† Spinning and twisting.

THE WOOLEN AND KNITTING MACHINERY STATISTICS OF THE UNITED STATES FOR THE YEAR 1900,

Giving the Sets of Woolen Cards in Woolen and Knitting Mills, the Worsted Combs, Looms, and Knitting Machines.

[The Shoddy Cards and Worsted Cards are not included under Woolen Sets or Combs.]

STATES.	WOOLEN.			KNITTING.	
	Sets of Woolen Cards (not including Worst'd Cards or Shoddy Cards).	Worsted Combs.	Looms.	Sets of Woolen Cards.	Knitting Machines.
Alabama	3		12		64
Arkansas	8		39		
California	32		148		87
Connecticut	566	49	3,769	114	1,435
Delaware	13		240		909
Florida					5
Georgia	30		495		1,317
Idaho	2		7		18
Illinois	82	3	277	10	2,311
Indiana	106		916	23	1,194
Iowa	39		193		256
Kansas	3		17		6
Kentucky	67	6	1,127		75
Louisiana					75
Maine	434	19	3,036		156
Maryland	30		238		750
Massachusetts	1,674	468	18,394	62	6,313
Michigan	60		175	14	2,841
Minnesota	41		168		438
Mississippi	27		40		90
Missouri	32		228		122
Nebraska	1		6		20
New Hampshire	383	30	5,522	87	4,146
New Jersey	194	118	4,425	26	1,350
New York	707	140	5,686	776	11,299
North Carolina	23		291	1	1,482
North Dakota	2		17		
Ohio	100	6	803	15	2,141
Oregon	33	1	169		23
Pennsylvania	1,024	392	21,753	42	28,775
Rhode Island	447	269	9,096	9	1,634
South Carolina			40		720
South Dakota	13		72		
Tennessee	73		1,317		873
Texas	4		118		30
Utah	21		114		103
Vermont	103		802	33	584
Virginia	52		313	34	753
Washington	2		30		22
West Virginia	42		296	2	472
Wisconsin	65	9	367	19	2,832
Wyoming	1		3		
	6,539	1,510	80,759	1,267	75,721
Sets of Woolen Cards in Knitting Mills	1,267				
Total Sets of Woolen Cards	7,806				

chines in the United States is 75,721.

In the silk industry there is not a satisfactory unit of capacity, unless we take the loom. In this summary both the number of spindles and looms are given. The spindles include both spinning and twisting, and the looms include broad and narrow looms, but not braiders. The figures show New Jersey to be in the lead in number of looms, having 23,984. Pennsylvania follows with 13,810; New York, 5414, and Connecticut, 1322. In spinning machinery Pennsylvania leads New Jersey, having 650,742 spindles, while New Jersey has 343,219. There are a total of 48,246 silk looms in the United States.

The above table gives the comparison of the machinery of 1900 with 1890, and the per cent. of increase:

These figures show that in the past ten years the cotton industry has increased about 50 per cent. A curious and rather singular showing is made in the woolen industry, which in the strictly woolen branch shows only an increase of about 8 per cent., but in the worsted branch, an increase of 76.6 per cent., while the number of woolen and worsted looms has increased 19 per cent. This shows plainly that the yarn for the increased number of looms has come from worsted and cotton spindles and not from strictly woolen machinery. The knitting industry has more than doubled in the past decade, and silk manufacturing has shown the greatest growth of all. An interesting feature brought out by the statistics of the silk industry is that the percentage of increase in number of looms has far exceeded that of number of spindles, which bears testimony to the increase in productive capacity per spindle.

COMPARISON OF TEXTILE MACHINERY IN 1900 WITH 1890.

	1900.	1890.	Per Cent. of Increase.
Cotton Spindles	21,057,983	14,188,103	48.4
Cotton Looms	490,398	324,866	50.9
Woolen Sets of Cards	7,806	7,245	7.9
Worsted Combs	1,510	855	76.6
Woolen and Worsted Looms	80,759	67,817	19
Knitting Machines	75,721	36,462	107.6
Silk Spinning and Twisting Spindles	1,426.245	718,360	98.5
Silk Looms	48,246	20,822	131.7

KNIT GOODS INDUSTRY IN THE SOUTH.

The growth of the cotton spinning and weaving industries in the Southern States, during the last five years, and the fact that now this section produces a large share of the coarse cotton knitting yarns made in the country, lead naturally to the query as to whether this trend of cotton manufacturing toward the cotton fields will carry with it the manufacture of knit goods, which are now so largely made of cotton.

The statistics of the growth of knitting mills in this section do not as yet shed much light upon this point. The knitting mills, reported by us in the South five years ago, numbered 41, having 2565 machines, and by The Textile World's 1900 Directory there are now 104 mills with 7525 machines in that section.

While this represents an increase of over 200 per cent., which, if continued, would soon transfer the seat of this industry to the South, yet the aggregate capacity of the Southern knitting mills was five years ago, and is yet, too small for us to safely draw conclusions as to any general tend-

ency of the business to go South. A half dozen knitting mills in the North could be named whose aggregate product now equals that of all the Southern mills combined.

Not so very long ago the question as to whether cotton spinning and weaving would be established extensively in the South was still "in the air." Today this industry has reached such proportions, and is enjoying such a degree of prosperity in the South as to attract attention not only in this country but abroad also, as a great industrial movement.

Are we to see this movement duplicated in the knitting business? Statistics of mill growth assist us but little in giving an answer, although we certainly find in them no suspicion of a negative reply to this question. An examination of the general conditions is the only source of information.

There is the important matter of help. It is an essential that knitting mills have a good supply of skilled employees, the majority of them girls and women.

Suitable employment for their girls and women is the great need in many Southern towns today. Large numbers of them are living on the farms and in the mountains, possessing intelligence, energy, ambition, but who lack opportunity. Work in knitting mills is clean, is not laborious, and commands good wages. It is work well suited for a large section of the Southern population, who would welcome it.

Most of the Southern knitting mills have been fairly successful and some of them are very prosperous, constantly increasing their plants. It is a mistake to suppose, however, that knitting mills in the South can succeed, unless equipped with first-class machinery and conducted on a scale to meet competition. Eighty-four-needle single thread hosiery, for instance, is made so extensively by Southern mills that they compete sharply among themselves, and any new mill going on to this class of goods must meet the existing conditions there.

One of the principal reasons for the success of the smaller cotton mills which have been started in such great numbers throughout the South is their first-class machinery equipment, and this must be one of the conditions of success in the knitting industry. Some months ago a Southern hosiery manufacturer in relating his experience, says that he was induced to go into the business in a small way, and put $7000 or $8000 into his plant. At the end of two years he found he had made no money, and just about held his own. He had to send his goods to Philadelphia to be dyed and finished, and his product was so small that the small margin of profit on his goods was entirely eaten up by the general expense. He resolved to make a fresh start, bought new automatic machinery and installed a dye plant, making an investment of over $60,000, and now is making a good profit.

The knitting business is peculiarly subject to being overdone. Today certain lines of the hosiery business are suffering from overproduction, and only recently steps have been taken by the Pennsylvania hosiery knitters looking toward curtailment of production, but manufacturing will follow the line of least resistance, which is usually termed cost, and if we may judge by its past rapid increase, the knitting business in the South is likely to show constant development, at first along the lines of the cheaper and coarser grades, followed later by the higher grades of goods.

There are other conditions which will render the growth slow. The business is established North and surrounded there by skilled labor. The inertia of the stationary body must first be overcome; the fact that not a bale of cotton can ever be grown in England has not prevented England from being the greatest cotton spinning country of the world, and it will be difficult to drive her out of the business. The same principles will operate to keep the knitting mills in the Northern states.

THE ACTION OF THE SOUTHERN COTTON YARN SPINNERS.

The recent action of the Board of Governors of the Southern Cotton Manufacturers' Association in sending North a committee of five to investigate the advisability of establishing direct selling agencies, following on the heels of the formation of the Yarn Dealers' Association, has aroused much discussion in the trade. The Board of Governors report that, having duly considered the present condition of the market, and been informed by reliable parties that there is no glut in the market, can see no reason for the unusual decline in prices, which they, therefore, believe is unwarranted, and advise members to organize for mutual protection, the inference being that their interests are not sufficiently well cared for in the hands of the yarn commission houses and independent selling agents. Whatever may be said as to the comparative advantages of a mill selling its product direct or through commission houses is not our purpose to discuss at this time, but we believe that the Southern cotton manufacturers will pursue a short-sighted policy, if by means of the plan suggested, or by any other means, they attempt to artificially bolster up prices.

Many of the Southern mills feel grieved that they have not had the benefit of the high prices for yarn which prevailed some months ago. They were under contract at low prices for months ahead, and, when their low priced orders ran out, prices were off again and cotton was high and they feel disgruntled and lay the blame on the commission house, and hint that they, and not the mills, got the benefit of the high prices. This may be warranted in some cases, certainly not in all. Other mills had high prices offered, and declined the opportunity, and are repenting with bad grace.

The actual amount of business done at top notch figures was probably small, but the prices look tempting now and excite regrets for what might have been. The high price of yarn undoubtedly had a marked effect in restricting advance orders and most top price sales were made for immediate consumption only.

Another fact that must not be lost sight of is the rapid increase in the productive capacity of the South on coarse cotton yarns. It is a serious question whether the productive capacity on this line of yarns has not anticipated consumption for some years to come, especially when supplemented by running overtime, and when the entire spindleage now under construction is in full production, competition will be more severe. The South is getting into a position where it will soon control the coarse yarn trade, and directly that happens, the price of such yarns will be regulated by the competition of Southern mills among themselves, and not by competition between North and South.

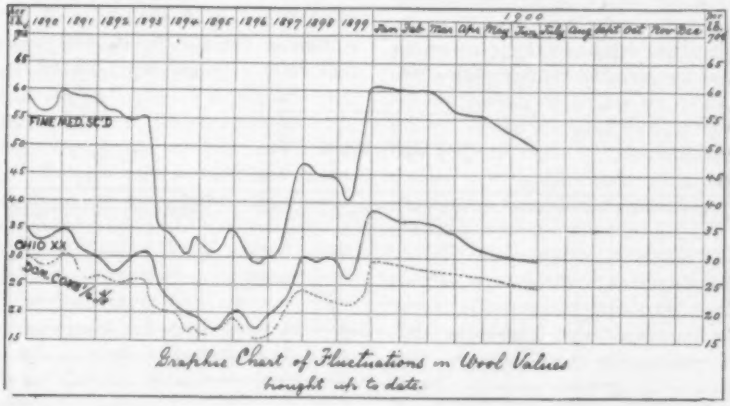
The report of the Committee will be awaited with interest. It seems difficult to formulate any plan which will provide for a general selling agency that will be satisfactory in ordinary times or in a dull market. A combination of the larger mills might be formed, but they would hardly do more than hold the umbrella for the smaller mills. It will be a difficult task for the Southern manufacturers to maintain a higher level of prices than the market warrants, even by an extensive organization such as that proposed.

The experience of the Northern combination of fine yarn manufacturers indicates how hard it is to maintain prices at an artificial level. This combination of fine yarn spinners was probably the strongest ever made in the yarn trade, and yet they found that, as independent concerns, price-lists were not rigidly maintained, and a consolidation in the form of a company seemed advisable to get the full benefit of combination idea. Even after this was done and the price of Egyptians advanced to a very high figure in the late boom, it could not be maintained, because customers would not buy, and the result was that in

order to induce purchasers, a large reduction in price had to be made.

There are doubtless other objects besides maintenance of prices that the Southern cotton yarn spinners will strive for. They are doubtless anxious to get in direct touch with the users of their product, and to secure any profit there may be in selling the yarn for themselves, but this opens up the whole subject of comparative advantages of selling direct or through commission houses.

WOOL MARKET.



Graphic Chart of Fluctuations in Wool Values brought up to date.

With manufacturers out of the market, light receipts of wool, reports of large mills curtailing production, and a dull goods' market, we have to record for the month of June, softening prices and the smallest sales on record for many years.

There has been no change in the course, which manufacturers have pursued for months, of keeping away from the wool market. The slackening in the demand for goods has served to strengthen the bearish sentiment on wool, and it looks as though wool prices must become adjusted to the price of goods for the coming light weight season, which usually opens in July. Speculation as to the opening of the light weight business is idle. Much interest is naturally felt as to the prices to be fixed by the woolen combine, and the opinion is generally held that this concern will pursue the course, which its parent company so long followed, of adjusting prices to the requirements of the market, making sure to provide for its entire production.

The best selection of a new clip is always taken up early, and at the present time it would be difficult to make large purchases of select lots of wool from old stock. It is probable, therefore, that no extensive operations will be seen in wool until the new clip is fairly before the trade.

The western growers are maintaining a firm attitude, the result being that the wool remains in the West, the expense and risk of carrying it resting on the western growers. It can be safely stated, that the eastern wool dealer is perfectly satisfied under present conditions to let the wool remain in the West, as he has troubles of his own in the shape of wool purchased above today's prices.

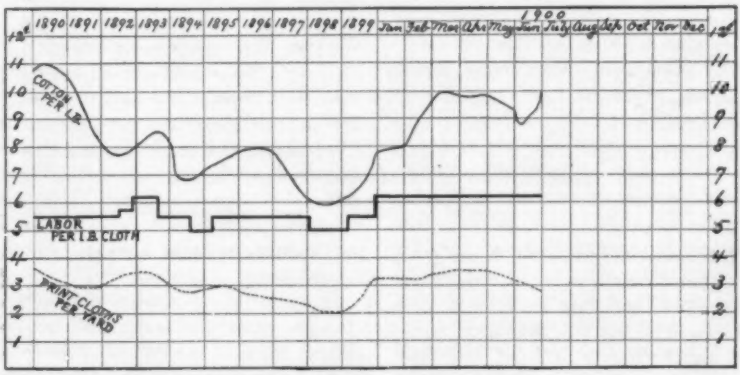
When the general market is so dull it is difficult to discover what grades show the most weakness, but it would probably be easier to sell the coarser grades of wool today. Fine goods are

especially dull; the high price, which fine wool reached last winter, checked the consumption, and turned attention to lower qualities, but there is evidently no wool famine even in coarse grades. Figures are manipulated to show a large deficiency in the world's wool supply. This has been done by assuming wool shipments to always represent wool clips and then comparing the figures for present times with the highest figures on record. Such statistics are manifestly misleading.

Prices are regulated by demand as well as supply, and the increasing use of wool substitutes is an important factor in the situation. The mills on all wool goods are generally running slack, while those woolen mills, which use no wool, are busy on cotton worsteds and shoddy woolens.

As the month closes with the wool market showing no signs of animation, the trade is looking forward to the opening of the light weight season on this side of the Atlantic, and the opening of the London sales on the other side. The weekly sales of wool in Boston for the five weeks ending June 30th, average only 1,800,000 lbs.

COTTON MARKET.



Graphic Chart of Fluctuations in Prices of Cotton, Labor and Print Cloths.

As our chart clearly shows, the month of June has witnessed a sharp break in prices, due to the collapse of the bull pool, and also a recovery to a point above the price prevailing at beginning of month.

The weather in the cotton belt has been generally favorable. Some exception can be made as to the Mississippi valley and Texas, where heavy rains prevailed early in June, but no serious damage is reported, and with an increase in acreage of 9 per cent. there is no reason to expect a short crop. This increase of acreage is somewhat offset by the late planting, which is reported in some sections to be from three to four weeks later than usual. This condition makes the bears cautious, and restricts predictions as to a "bumper" crop. With the exception of this delay in the new crop getting under way and the small and steadily diminishing stocks in sight there has been nothing to alarm the bears.

The cotton goods situation both here and abroad has lost the buoyancy of a short time ago, and we hear now of slow sales, rumors of short hours and reduction of wages. The reduction in price of print cloths at Fall River the last of May to 3⅛ cents proved insufficient to move the goods, and the selling committee follows it up, as June closes, with another cut to 2⅞ cents, which price had been previously made by outside manufacturers, whose quo-

tations reflect more accurately the existing market conditions. No sales are reported at the latest quotations, and stocks of goods are piling up, and now the Fall River print cloth mills have agreed to shut down for four weeks.

Under such conditions the mills have not looked with favor upon the idea of increasing their stocks of raw material. Both spot and futures have been neglected here and abroad and mill men seem satisfied to await developments.

But it cannot be denied that there is anxiety among consumers as to the full effect of the extremely low stock of cotton in sight. The stock is the lowest in years. English mill men are nervously figuring whether it will last until the new crop arrives, and speculating as to four days a week for Lancashire in September by reason of cotton shortage. They loudly assert that the cotton will come from somewhere, but fail to say where.

The cotton in sight June 30th in world's markets is reported by Chronicle as 1,470,053 bales, compared with 3,072,592 bales on same date in 1899, 2,433,506 bales in 1898 and 1,897,743 bales in 1897.

This shortage would neutralize the bearish effect of a very large crop, and the prospect of an average sized crop in America, with a short one in India, is not comforting those desiring cheap cotton.

Depression in Cotton Industry in India.

The cotton mill owners in India are thoroughly alarmed over the situation which confronts them. What with the famine and the consequent reduction in purchasing power of the population and the increase of the productive capacity of the mills until the market is glutted, a serious condition of affairs is threatened, and meetings of mill owners have been held in view of arriving at some concerted action to relieve the situation.

Sir George Cotton, one of the leading manufacturers in Bombay, and chairman of the Bombay Mill Owners' Association, tells his colleagues plainly that they have overdone the industry by extension and that for a long time to come consumption is unlikely to overtake production. Shorter hours for running time are advocated and diversification of the product. Indian mills have largely confined themselves to spinning lower counts, up to 24s, and in considering the suggested step of spinning higher counts, to 40s, the fact is brought out that the Indian supply of long stapled cotton is not sufficient. For many years, in the early part of the century, India grew and exported an excellent quality of longer staple cotton known as the Ahmood variety, which has run out, and if the Indian mill owners are to spin finer yarns, some steps must be taken to stimulate the growth of longer stapled cotton.

American competition is also beginning to be recognized as an important factor in the export trade of the Indian mills, who now do considerable business with other Asiatic markets, especially in yarns.

Knit Goods Abroad.

The reports from the leading knitting centres abroad, all indicate the same condition of affairs; plenty of orders, scarcity of help, manufacturers maintaining a very firm attitude.

The American buyers have found so marked a change from past years that many of them returned home without completing their purchases, while others restricted their orders to the lowest possible limit.

Help has been scarce abroad, and the finishing rooms have been clogged with goods lying unfinished, owing to lack of girls and women to complete them.

Raw material had advanced to such a point that it was absolutely necessary the manufacturers should secure an advance. Prices have risen 40 per cent. on some grades of Chemnitz goods during the last year, and at this advance the purchaser has been informed that if he doesn't like the

trade he can leave the goods alone.

This condition has kept volumes of trade below what it otherwise would have been; the exports of knit goods to the States from Nottingham district for quarter ending March 31st, 1900, show a decrease of £4,328 as compared with same period of 1899, while Chemnitz' exports of knit fabrics to the United States for the same period of 1900, show an increase of £11,576 over 1899.

These figures are more striking when considered in connection with the general prosperity in the U. S. during the latter period, and the large quantities of goods of all kinds consumed there. The American tariff along with the high prices asked for goods has kept the volume of American trade down to the size prevailing when times were bad, and the deficiency has been supplied by American mills, which are steadily advancing to the point where they can make the goods which have formerly come from Europe.

The recent fall in prices of wool and cotton has made very little difference in the views of knit goods manufacturers in Europe, as they have their production well sold up until late in the fall.

The delay in deliveries has caused the season's business to last six weeks later than usual.

In hosiery, fancy goods have had a good run, particularly in men's goods. The indications are that fancy goods will be in demand next season. Extracted and printed goods are very popular.

Prize for Wrinkles and Kinks.

We offer a cash prize of $10 for the best wrinkle and practical kink or idea in connection with knitting processes, including all the different departments of that industry, except in connection with yarn spinning and dyeing. The conditions are that it must be received prior to August 20th, that it shall not be patented, and that it must have been in use, but not hitherto published. It need not necessarily be original with the sender. Anything that we may consider good enough to publish will be paid for at our regular rates, whether the prize is awarded to the author or not. The award will be made by the editor, after consultation with several well-posted men in the trade. If the idea relates to machinery, or can be illustrated by drawings or photographs, these will enhance its value, and will be considered favorable in the ultimate decision.

The following wrinkle gives an example of what sort of an idea is wanted, although it may relate to machinery, processes or methods. Many a knitter has some little kink of his own, which is ingenious, which would be of value to others and which he can impart without detriment to himself.

GETTING EVEN WEIGHT OF GOODS.

During the war our mill had some very heavy orders for shirts and drawers from the war department.

We had to get the colors and quality very exact, and also the weight, that is, the goods must be up to a certain weight or they were not accepted, while no matter how much heavier they were, there was no extra price for the increased stock consumed.

With such heavy orders as we had to execute in this line, it was just on the verge of insanity to give Uncle Sam many extra ounces in weight of goods per dozen, which he didn't want, and consequently wouldn't pay for. On the other hand, to run below standard was suicide, hence we had to keep just as near absolutely standard weight as possible.

My method was to size my yarns carefully from the centre of the cop, and then to run just two feet of marked yarn into the goods, counting the number of needles, thus with the same size of yarn I could get exactly the same tension on all cylinders, and with this foundation and care in finishing and bundling, it used to just make the old man smile as he laid dozen after dozen on the scale and saw them tip at just the correct weight, with no danger of rejection.

and as near nothing to spare as possible.

There is a great deal of advantage in this system of knitting a given length of even carefully sized yarn, and not only counting but recording for future reference the size of yarn and exact number of stitches it produced in a given length. This enables the duplicating of goods as to weight and general appearance with the greatest convenience of any system I ever tried as you see you get the exact tension every time as well as the size of yarn, and you know what you have got for a foundation to work upon in making the web for any given size or style of garment.

Style Suggestions for Woolen Manufacturers.

There has probably been no season for some years in which the outlook has such an element of doubt as the present one. The trade purchased heavily of winter goods, both suitings and overcoatings, and since have reduced their orders very materially. This has made the manufacturer more cautious, and less inclined to high prices, than during the boom of December and January, and while many are figuring to bring out their light weight lines at an advance of only 10 to 15 per cent. over last year's opening prices, the desire to obtain orders is such that it is doubtful if the advance will be more than 5 per cent., if any at all. Many commission merchants will not allow the advance, if possible to avoid it, and some western mills have already opened their lines at last year's opening prices.

It will also be a sample piece season. The large orders which the clothiers found they were unable to use on heavy weights will make them cautious about placing quantities, and the business will be done as formerly, sample piece orders and duplicates placed when sold, which is without doubt more satisfactory than the placing of large orders and the return of more than half after delivery, which has been the case, whether merchants will admit it or not.

The fabric which was the most popular a season ago and will obtain a ready sale, if made in very cheap goods, is the flannel stripe. These should be made in Oxford mixes with various colored stripes, the width of same being from one-quarter inch to three-quarters in the various patterns. There is also an olive mix which if overplaid with dark green will be a taking pattern.

The cheviots for less than a dollar, which had such a large sale a few seasons ago, will also be in demand, and these should be finished down close, and hard, for while they will sell it is not from any particular liking of the fabric, but simply that with the advance in goods they fill in a place which would otherwise have to be filled with high priced cassimeres.

The colorings in these will show as in the past two seasons a predominance of grey mixes, and there should also be olives, and olive green mixes, combined with light mixes of the same character and overplaided with fancy colors. The patterns are the medium sized plaids, the neat effects not showing up and the larger ones being too bold.

Cassimeres in cotton mix and all wool fabrics should show more light colorings than dark, and the finish should be close, the face firm and hard, without harshness.

The same colorings as in the cheviot effects will be in demand, but in the patterns more white should be used, for they must show bright and clear, and the neater patterns must be in the majority.

The newest thing in worsteds is the doeskin stripe, and these should be made in wide and narrow filling roll patterns, which effects are again coming into prominence.

The light slates and the olives are the best shades for both these and the twill worsted fabrics, in which, as in all other lines, the medium sized patterns should be the largest number.

Coverts for light weight overcoat-

ings are staple goods and are always in demand in the three weaves, the regular covert, the narrow whipcord, and the wide one, and should be made firm and 14 to 15 ounces in weight, and in tan, stone and olive colorings.

The regular venetians have been so cheapened by the dress goods makers producing them that while they still sell they are extremely poor property to make, for the average manufacturer for the makers who hold the market in this fabric sell same for what it would cost another maker to produce.

is in the welting and looping room of the same mill.

This mill is a type of many which have been started in Pennsylvania towns, employing the women and girls from the neighborhood, training them to the work in which they soon become adept.

When planned and equipped right, and run intelligently by practical men, they have usually been successful, although now the competition among themselves is becoming very sharp, and profits are narrowed down to a few cents per dozen.

KNITTING MILL OPERATIVES.

While the American Woolen Co. intend opening July 16 to 23, their action will have no influence on the opening of the market, for it is the general impression among merchants that they will show as soon as ready, and not wait for the American Woolen Co.

Pennsylvania Knitting Mill Operatives.

The accompanying illustrations show a typical group of Pennsylvania hosiery mill operatives. One shows the knitters in the Bath Knitting Mills, Bath, Pa., and the other view

The advantage of bright, intelligent help is clearly shown under these conditions, and Pennsylvania girls, like these in the Bath Knitting Mills, generally have shown a decided aptitude for this work.

—The imports of raw cotton for the 11 months ending May, 1900, amount to 65,245,608 lbs., as compared with 46,428,632 lbs. in 1899. The imports of manufactured cottons for same period show a marked increase in value in 1900 as compared with 1899; the figures being $30,745,852 for 1900 and $23,692,963 in 1899.

Commencement Exercises of the Philadelphia Textile School.

The commencement exercises of the Philadelphia Textile School and the Pennsylvania Museum and School of Industrial Arts were held in Horticultural Hall, Philadelphia, on the evening of June 7th. The stage and auditorium of the hall were filled with friends of the students, while all about were potted plants and decorations. The exercises were presided over by the principal, Mr. L. W. Miller, who awarded the diplomas and prizes to the fourteen graduates, eight going to the students in the Art School, and six to the students in the Textile School. An address was made by Theo. C. Search, president.

Other remarks were made by the Chairman of the Associate Committee, Mr. E. D. Gillipse, and Mr. R. D. Andrews, of Boston, the latter speaking on The Origin and Cause of Art Schools, and a very interesting address. Richard Young, vice-president of the institution, and a member of the National Association of Manufacturers, also made fitting remarks.

Next came the awarding of prizes to the students. In the Textile School prizes were awarded as follows:

First prize, $10.00, for original designs, to Frederick Otto Zenke of New York, who was sent by the well known house of Faulkner, Page & Co. Honorable mention to Percy Taylor Phillips of Philadelphia, and Wm. H. Smith of Phillipsburg, N. J.

Second prize, $10.00 for executed work in original design, awarded to Walter Whitten Dudley.

Then came the awarding of the gold medal given by the Textile World for results in final examinations and term work in dyeing, which was awarded to J. B. A. Wilson.

The medal for final examination and term work in chemistry, given by the Dyer's Trade Journal, was awarded to Wilfred Senior. Prize scholarships for school year 1900-1901, were awarded to Perry Taylor Phelps of Philadelphia and Frederick Otto Zenke of New York, honorable mention being given, first year, to Perry Taylor Phillips, of Philadelphia, and Wm. H. Smith, of Phillipsburg. Second year, Howard Fuller, Providence, R. I., Frederick Filder, of La Porte, Ind., and Robt. C. Damon, Concord, N. H.

IN THE WELTING AND LOOPING ROOM.

Diplomas of the Textile School for the successful completion of the three years' regular course were awarded to the following:

M. G. Einstein, F. S. Nettleton, L. V. Brannen, C. F. Sweney, R. J. Doyle and C. S. Althouse.

The school closed one of its most successful years in all departments. Mr. E. W. France, director of the Textile School, was pronounced in his praise for the good work of the students the past year.

Many fine samples of the work done by the students in the dyeing and chemistry departments were on exhibition and showed the thoroughness of the work carried on in these studies.

The Gold Medal Winner.

The Textile World gold medal, given for the best results in final examination and term work in dyeing, at the Philadelphia Textile School, was awarded this year to J. B. A. Wilson. Mr. Wilson was born in Philadelphia, in the year 1882, and received his preliminary education in the public schools of that city. He entered the department of Chemistry and Dyeing at this school, in 1898, and during his course in the institution has been a diligent student and stood high in his classes.

He has received the highest commendation from both his teachers and fellow students, and we predict a useful and successful career for the young man, if he applies to the practical problems of life the same energy and intelligent effort that he has exhibited in his studies at the textile school.

The Pioneer Combed Hosiery Yarn Mill in the South.

The new mill of the Richmond Spinning Co., Chattanooga, Tenn., has recently started up to make combed Egyptian, and combed and carded American Peeler hosiery yarns. There are one or two other combed yarn mills in the South, but not on the same class of yarn. The picture shows an attractive mill building, with pleasant surroundings, and the equipment is a model one. This mill was built almost entirely by local capital raised

J. B. A. WILSON,
Winner of the Textile World's Gold Medal.

in the vicinity of Chattanooga. E. G. Richmond is the president; David Giles, vice-president; and M. Llewellyn, secretary and treasurer. Arnold B. Sanford, of Boston, has been the leading spirit in the enterprise, and is now its general sales agent and one of the board of directors. To him was entrusted the general plan of the mill, selection of machinery and personnel. Mr. Sanford was exceptionally fortunate in securing a good staff. J. N. Trainor, of Chester, Pa., is the practical superintendent in charge of the mill, having a staff of New England overseers, and many of the skilled help have come from the North, particularly the mule spinners. The opening, picking, carding and roving machinery is of Howard & Bullough American Machine Co.'s make, with Hetherington combers and Asa Lee mules. Both Universal and Broadbent winders are used. The present equipment is 5000 spindles, and product is sold far ahead at prices fully equal to the best Northern mills. The officers of the company feel gratified at the good start that has been made; their first shipment of yarn brought forth high praise from customers. The

plant is very well balanced, so that no part of the machinery is overcrowded, insuring smooth and easy running. The product is combed Egyptians and carded cops and cones and combed and carded American Peelers from No. 8's to No. 24's, all mule spun.

Notes of the Month.

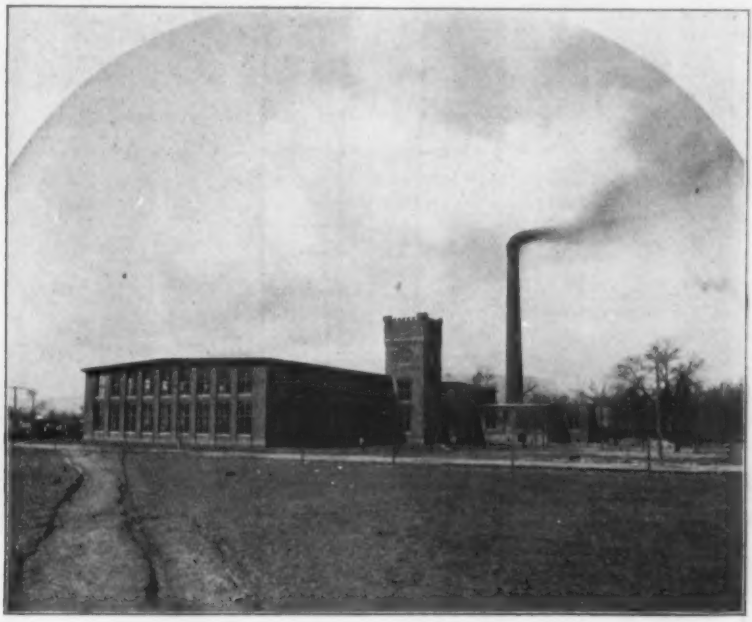
—An encouraging feature in the textile industrial situation is the prompt disposition on the part of the mills to curtail production, when orders are filled.

—The projected co-operative cotton mill in Fall River has been hanging fire for some time. The labor unions have shown an unwillingness to invest their surplus in the enterprise.

—The imports of wool (all three classes) into the United States for 11 months ending May, 1900, amount to 145,133,986 lbs., compared with 68,319,805 lbs. same period of 1899.

The value of manufactured woolens brought in during same period of 1900 was $14,800,930 against $12,754,580 for 1899.

—The cotton goods industry will in all probability be affected by the Chinese troubles. The outbreak of hostilities has already resulted in a curtailment of trade with China, and still greater reduction in this trade will follow, if the trouble is not speedily settled. The ultimate effect of this war is likely to result in greatly enlarging the market for cotton goods by the opening up to the trade of the outside world, of a nation having a population of 400,000,000, five times that of the United States.

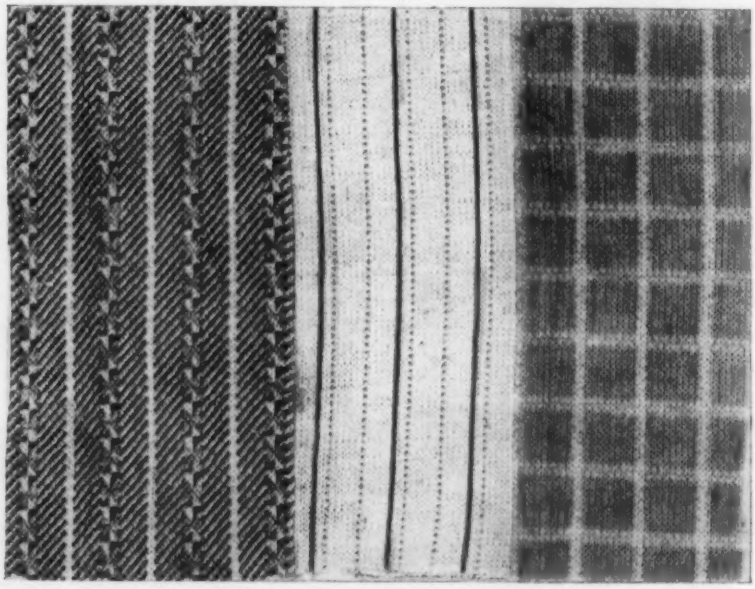


RICHMOND SPINNING CO'S NEW MILL, CHATTANOOGA, TENN.

—Most of the processes through which the cotton is put in China before it is ready to be worn bear a marked resemblance to those in use in western lands a hundred years ago.

Printed Knit Fabrics.

The accompanying illustration shows samples of light balbriggan knit goods printed in the roll; it is difficult to convey an idea of the color values with the black ink. These samples are printed on white in single colors in blues, reds and greens, while others are in lilac and old rose. The effect in the large piece is very handsome, and we understand that the goods have had a very successful run. There is quite a knack in printing these light weight fabrics, and those printers who have succeeded in accomplishing it are having a great run. This idea of printing fabrics gives great scope for the designer's skill, and when fast colors are employed, they make up into most comfortable, as well as handsome, garments. There should be a great field for these in negligee shirts for men, and women's shirt waists, skirts, etc.



BALBRIGGAN KNIT GOODS PRINTED IN THE ROLL.

—The manufacture of cotton in China is at present in a transitional state, owing to the general introduction of Japanese, Indian, and, more recently, Chinese machine-spun yarns.

Foreign Notes.

—The French cotton manufacturers are disturbed over the threatened loss of their export trade to the French possessions in the extreme Orient by the competition of the cotton mills in Pondicherry, British India. The use in the last named mills of the best English machinery, along with cheap labor, long hours and freedom from restrictive labor laws, is proving a serious matter to the French manufacturers, and they are calling on the government to take measures for protection.

—The black cloth trade in Elbeuf fine goods and the old-fashioned fancies with a velvet finish has diminished, although these goods at one time ranked very high, and the decrease is due to the preference for tweeds and worsteds. Some firms on the continent have attempted these goods, and adopted the Scotch system of dyeing the yarns in the hank, and otherwise imitating the Scotch system of manufacture and finish.

—According to a statement made to

British consul by the managers of the Chinese cotton mill at Hang-chow, the past year has been a prosperous one for that concern. The mill had 15,000 spindles in operation; the daily output on a day and night schedule is 11,000 lbs. of yarn; 1200 hands are employed. The spinners' wages vary from 20 to 50 cents per day.

—The practical operation of English labor laws was illustrated recently by an action before the West Riding Police Court, Huddersfield, in which Shaw and Shaw, cotton spinners, sought to recover from Joshua Sykes, cotton doubler, formerly in their employ, £2 damages for having left his work without notice. The man's earnings were 32s. or 33s. a week. He had four little children to keep. The defendant, in reply to the Bench, said he was earning from 35s. to 36s. a week in Lancashire. He was ordered to pay 30s. damages and 7s. 6d. costs.

—Wages in England were advancing during May. Changes affecting 181,200 workpeople were reported. All except 300 received increases, which average 25.8 cents per week for each one of the whole number reported. Changes affecting 9900 workpeople were preceded by strikes; direct negotiation between employees and employer was conducted by 12,900 of them. The changes affecting the rest, numbering 158,400, were the result of sliding scales.

—During the recent strike in the knitting mills of Troyes, France, the manufacturers gave to the government a signed statement of the wages paid to their operatives, as shown by the payrolls in the mills of the signers. Following are the daily wages reported:

MEN.

"Cotton" and "Onion" machines	$1.38
Flat machines	1.28
Circular machines	1.30
German machines	1.27
Folders	1.09
Shapers	1.02

WOMEN.

Winders	$0.73
Embroiderers	.72
Ironers	.72
Cutters	.71
Button sewers	.71
Sewers	.68
Stampers	.66
Menders	.64
Unravellers	.31

CHILDREN.

Helper on Cotton machine	$0.67
Nappers	.63
Apprentices	.37

—English manufacturers, who have always led the procession in the manufacture of low cotton and shoddy goods, are beginning to feel the effects of competition from the Continent on this grade of goods.

The towns of Mazamet and Vienne in France had begun to compete in shoddy goods twelve years ago; having a favorable location, where wages were the lowest and living the cheapest. These goods should be compared with goods from the Colne Valley and Dewsbury districts, both being imitations of Scotch tweeds in shoddy materials. Austrian low fancies may be inferior to the English goods, but they command the markets, by reason of tariffs. Belgium appears to have made headway, and the manufacturers of Verviers have obtained a reputation for cheap goods in recent years.

—The British consul at Stettin reports that the ready-made clothing trade has become the most important industry at that place. Thousands of women and girls are able to earn a respectable livelihood, and are allowed to make clothes at their homes. Even the wives of Government officials earning small salaries employ their spare time in sewing for the manufacturers. The year's production of ready-made clothing amounted to about £1,500,000, and about £250,000 were paid in wages. Forty firms are engaged in this industry at Stettin, giving employment to about 10,000 hands.

—The Cotton Exchange at Bremen ranks next to Liverpool in amount of business done. The business of the Bremen exchange has grown from 97,000 bales, in 1875, to 1,431,000 bales in 1899. A new building is now being erected and is the first one in Germany to be built on the American system, that is to say, of steel construction.

Notes of the Month.

—The small stock of raw cotton in the world's markets has been accompanied by a reduced movement of the staple from this country. The exports for 11 months, ending May, 1900, being 5,942,922 bales as compared with 7,102,496 bales for same period of 1899.

Of cotton goods we exported a smaller quantity in 1900 than in 1899, the figures being 327,706,980 yards for the 11 months ending with May, 1900, and 358,693,026 yards for same period of 1899.

Owing to rise of values the exports of 1900 were valued at $146,917 more than those of 1899.

The countries which took a larger quantity of cotton goods from us in 1900 than in 1899 are France, Central America, Cuba, Porto Rico, West Indies, British East Indies and Australia, Hawaiian Islands, the Philippines and Oceanica. The countries showing largest decrease are United Kingdom and South America. China took 172,096,305 yards in 11 months of 1900 and 185,737,434 yards in 1899.

—The project of forming a combination of worsted yarn manufacturers is being revived in certain quarters. The present time cannot be called especially opportune for such an enterprise, but the comparatively uniform character of worsted yarns and the great expense of the machinery required for their manufacture renders competition more difficult than in other lines of textiles, and makes this field more inviting to the trust promoter.

It is understood that seventeen or eighteen of the leading worsted yarn mills have given options on their plants; the property is to be paid for in part cash and stock. It is the general impression in the trade that this combine will not be carried out.

—German worsted manufacturers, representing 1,400,000 spindles, have resolved to reduce their production about 20 per cent. between July 1st and December 31st, 1900, in order to stop the decline in prices. A movement among the Swiss, Austrian and Russian manufacturers to bring about a similar reduction has been started.

The American Bridge Company.

The American Bridge Company have issued the following circular letter to the trade:

"As a result of numerous conferences it has been deemed expedient to organize the American Bridge Company, incorporated for the purpose of designing, building and erecting bridges and all classes of metallic structures. The facilities at our disposal are such that we have every confidence that we shall be able to give you the advantage of very favorable quotations and at the same time be enabled to avoid delays in delivery which in the past have proved so vexatious in many instances. We solicit your inquiries which shall have our very best attention."

Accompanying this is a list of the various bridge companies forming the consolidation, as follows:

American Bridge Works, Chicago, Ill.
Berlin Iron Bridge Co., East Berlin, Conn.
Buffalo Bridge & Iron Works, Buffalo, N. Y.
Carnegie Steel Co. (Keystone Plant), Pittsburg, Pa.
Edge Moor Bridge Works, Wilmington, Del.
Elmira Bridge Co., Elmira, N. Y.
Gillette-Herzog Mfg. Co., Minneapolis, Minn.
Groton Bridge & Mfg. Co., Groton, N. Y.
Hilton Bridge Construction Co., Albany, N. Y.
Horseheads Bridge Co., Horseheads, N. Y.
Lafayette Bridge Co., Lafayette, Ind.
Lassig Bridge & Iron Works, Chicago, Ill.
N. J. Steel & Iron Co., Trenton, N. J.
New Columbus Bridge Co., Columbus, O.
Pittsburg Bridge Co., Pittsburg, Pa.
A. & P. Roberts Co. (Pencoyd Iron Works), Pencoyd, Pa.
Post & McCord, Brooklyn, N. Y.
Rochester Bridge & Iron Works, Rochester, N. Y.
Schultz Bridge & Iron Works, Pittsburg, Pa.
Shiffler Bridge & Iron Co., Pittsburg, Pa.
Union Bridge Co., Athens, Pa.
Milwaukee Bridge Co., Milwaukee, Wis.
Wrought Iron Bridge Co., Canton, Ohio.
Youngstown Bridge Co., Youngstown, O.

This list contains all the leading

companies that manufacture bridge and structural work in this country, with the combined capacity of 600,000 tons per annum. The Pencoyd plant, of the A. & P. Roberts Company, also comprises one of the best and most complete rolling mills for structural material in existence, with a capacity of 200,000 tons per annum. This puts the American Bridge Company in a position to furnish all classes of bridge and structural work at an absolute minimum of cost, and in the very shortest possible time, and this has already been announced as the future policy of the company. No advance in prices will be made, but the cost of production will be reduced to an absolute minimum, and judging from the known facilities of the various plants, the facts would seem to justify the statement.

The directors of the company are as follows:

Percival Roberts, Jr. (A. & P. Roberts Co.—Pencoyd Iron Works), Pencoyd, Pa.
Alfred C. Case (Carnegie Steel Co.), Pittsburg, Pa.
William H. McCord (Post & McCord), Brooklyn, N. Y.
Charles M. Jarvis (Berlin Iron Bridge Co.), East Berlin, Conn.
William H. Connell (Edge Moor Bridge Works), Wilmington, Del.
Walter Hawxhurst (Elmira Bridge Co.), Elmira, N. Y.
Charles Macdonald (Union Bridge Co.), Athens, Pa.
Frank Conger (Groton Bridge Co.), Groton, N. Y.
James P. Kennedy (Youngstown Bridge Co.), Youngstown, Ohio.
Lewis S. Gillette (Gillette-Herzog Mfg. Co.), Minneapolis, Minn.
John F. Alden (Rochester Bridge & Iron Works), Rochester, N. Y.
Walter G. Oakman (Guarantee Trust Co.), New York, N. Y.
J. P. Ord (General Electric Company), Schenectady, N. Y.
Robert Winsor (Kidder, Peabody & Co.), Boston, Mass.
Robert Bacon (J. P. Morgan & Co.), New York, N. Y.
Charles Steele (J. P. Morgan & Co.), New York, N. Y.
Paul E. DeFere (40 Wall St.), New York, N. Y.
Robert S. Green (1 Montgomery St.), Jersey City, N. J.
J. W. Walker (Shiffler Bridge Co.), Pittsburg, Pa.
Abram S. Hewitt (Cooper, Hewitt & Co.), New York, N. Y.
August Belmont (August Belmont & Co.), New York, N. Y.

The majority of this board are practical bridge men who have in years past made a success of their individual companies. The financial end is unusually strong, being represented by firms and institutions of world-wide financial strength; thus forming a combination of practical and successful bridge men, backed by the strongest of financial resources.

The executive organization is made up entirely of men of large practical experience, headed by Percival Roberts, Jr.,—one of the leading rolling mill managers of the country. The Pencoyd plant of the A. & P. Roberts Company, comprising a rolling mill with a capacity of 200,000 tons per annum and the most complete bridge and structural plant in the world, has all been developed under his personal supervision, and is the result of his energy and ability—eminently fitting him to head an enterprise of this kind.

Joshua A. Hatfield has been appointed as assistant to the president, and will also have charge of the sales of the rolling mill products of the Pencoyd plant—a position which his long and favorable connection with the sales department of the rolling mill interests of the country makes him especially adapted.

The Engineering Department is in charge of Mr. Charles C. Schneider, formerly Chief Engineer of the Pencoyd Iron Works, of the A. & P. Roberts Company, with the title of Vice-President, in Charge of Engineering. Mr. Schneider has full charge of all questions of engineering, including the preparation of all plans, estimates and working drawings—all engineers of the company, whether engaged in the Contracting, Operating or Erecting Departments, are under the Vice-President in Charge of Engineering. At different localities throughout the country are stationed a corps of designing engineers to prepare preliminary plans and estimates, and at each plant will be located a full and complete corp of engineers and draughtsmen to prepare plans for the work fabricated at that particular plant.

The Operating Department is in charge of Mr. Charles M. Jarvis, for-

merly President of The Berlin Iron Bridge Company, with the title of Vice-President in Charge of Operating. As soon as contracts for any work are taken, they are immediately turned over to this department for execution, and consequently all the plants and erecting forces of the company belong in this department. At each plant is a manager, with full charge over all employees and the operations of that particular plant. Where a number of plants are closely located, they are placed under one local manager, each plant being equipped with a superintendent. All managers are under the direct charge of a General Manager, Mr. James P. Kennedy, formerly President of the Youngstown Bridge Company, who moves about among the various plants in order to see that all are working in one harmonious whole, and that each has the advantage of the experience of every other plant. The erecting is also in charge of the Operating Department, and this is under Mr. William Wennas, as superintendent. Mr. Wennas has had full charge of all the Pencoyd erecting for a number of years, and gained a world-wide reputation but a short time ago for the economical and expeditious manner in which he handled the erection of the famous Atbara Bridge.

All the sales of the company are in charge of The Contracting Department. This is divided into three distinct parts:

Railway Contracting.
Highway Contracting.
Structural Contracting.

The Railway Contracting is in charge of Mr. Charles Macdonald, formerly President of the Union Bridge Company. The Highway Contracting is in charge of Mr. Frank Conger, formerly President of the Groton Bridge & Manufacturing Company, and the Structural Contracting is in charge of Mr. W. H. McCord, formerly of the Post & McCord Company. The preparation of all proposals and contracts is in charge of this department. The company have opened contracting offices in different parts of the country, each office reporting daily, by wire, to various members of the Contracting Department. The Contracting Department of the American Bridge Company is one of the most important, as here are made up the proposals and estimates on all work, and it might almost be said that on the careful judgment and management of the members of this department depends chiefly the success of the company.

The Mechanical Department has been made of equal importance with all other departments, and has been placed in charge of Mr. James Christie, formerly Mechanical Engineer of the Pencoyd Plant, with the title of Vice-President. The mechanical details of all the various plants belong to this department, and the selection of Mr. Christie as the head insures the American Bridge Company of mechanical equipment that will guarantee the production of a pound of finished bridge material at the absolute minimum expenditure of power.

The Financial Department is in charge of Mr. William H. Connell, formerly President of the Edge Moor Bridge Works, as Treasurer, with F. M. Wyant, formerly General Manager of the Wrought Iron Bridge Company and F. H. Schmidt, formerly Secretary and Treasurer of the Youngstown Bridge Company, as Assistant Treasurers.

The Auditor of the American Bridge Company is Mr. Charles C. Price, formerly with the Pencoyd Iron Works, of the A. & P. Roberts Company.

The Purchasing Department is in charge of Mr. Francis W. Heisler, formerly Purchasing Agent for Edge Moor Bridge Works, with headquarters at No. 259 South Fourth St., Philadelphia, Pa. The Assistant Purchasing Agent is Mr. E. A. Muench, formerly Purchasing Agent for the A. & P. Roberts Company.

The Secretary of the company is Mr. Douglas O. Morgan, formerly a member of the law firm of Seward, Guthrie & Steele.

KNITTING DEPARTMENT.

The Knit Goods Situation.

The importing hosiery business contiues to be a law unto itself. Its strength is sustained without regard to other departments of the market. There is a general impression that Chemnitz prices have touched top, but the feeling is equally confident that present quotations will prevail for some time to come.

There is more call for help than ever and lack of machinery is fast bringing about a scarcity of certain lines now enjoying a run, such as embroidered goods. Orders in some of these have been positively refused for six months to come, in a number of instances.

It should be remembered that the German markets have amplified wonderfully of late, so that Americans can now be slangily told, "there are others."

On the other side it is worthy of note that while no goods are accumulating abroad in storehouses, the demands of the average customer are more promptly responded to by foreign manufacturers, than two or three months ago. This is not saying, however, that there are still not many orders long overdue. Immediate delivery goods are plums quickly to be plucked. Many staples are yet a month or more in arrears. Indeed, the best manufacturers have enough work in sight to keep them busy from six to eight months.

As a matter of fact goods have been received just fast enough to keep the trade appeased, without overloading stocks. Importers are warranted in expecting active fall business.

At the same time, many orders for imported goods have been held off, owing to stiffness of certain manufacturer's demands. Should speculation develop any decidedly weak spots in raw materials, sharp weakness, with speedy recovery of loss, may confidently be expected.

Manufacturers abroad, however, do not realize that orders have been held off, and their attitude is likely to be uncompromising. Under present conditions the growing competition of American low grades is not appreciable, but sooner or later it is a factor that must be reckoned with.

The situation hinges almost entirely on the spinners. Ultimately they may be obliged to succumb, but their determination (and money) promises to make the struggle long and bitter.

Many new colors are shown, following the new Paris shades; most of the designs are admirable in the refinement of their contrasts. Stripes are exceedingly popular. The increasing call for fancies seems to be a surplus demand, for sales of black staples show a slow but steady gain.

The soft spots in the wool market have caused a few cancellations on wool orders that were unwarranted, for full wool goods do not cut much of a figure in the total.

Underwear manufacturers are not so busy. Running overtime has virtually ceased. The warmer weather, however, has helped the jobbers, who went through several dull weeks firmly. The undertone evidenced thereby is a mighty encouraging pointer.

Cheap balbriggan makers are doing capitally; otherwise the reorder business just now is not what might be desired. The cool weather does not fully account for the falling off.

The mellow spots in cotton and wool bring little alarm to the shrewder manufacturers for they reflect that their orders, taken at much lower prices, are therefore property sure not to go begging.

Taken altogether, indications are that the summer season will eventually be rounded out with at least a fairly satisfactory volume of trade.

The intemperate advice of some dealers unquestionably caused placing the same orders with more than one mill; such recoil ought to fall entirely on the heads of those who set it in motion.

The worst effect of the weakness in materials is that it gives an element of uncertainty to prospective business. Buyers of light weights are holding off in the hope of reaching a more stable plane.

If the present spring sales are backward, it puts a damper on movements for the spring to come. When to these elements, backwardness in heavy weights is added, the situation becomes doubly halting. At last, however, heavy weights are well taken, particularly fleeces.

Beyond doubt the masses have been too busily engaged, for several months past, to allow much time for marketing; their money is bound to come out within a few months. But the delay on next spring's order business is due to several causes. The position of gauze goods is being greatly modified by new fabrics. At the last minute some of the lighter balbriggans are being metamorphosed, in order that they may better keep up with the procession.

Imports Knit Goods into United States.

Year.	Cotton.	Woolen.
1890	$7,149,030	$1,983,033
1891	6,728,775	1,249,459
1892	5,833,952	1,162,853
1893	6,392,175	1,408,390
1894	4,360,655	1,005,899
1895	6,535,179	937,999
1896	6,190,672	2,541,672
1897	5,596,703	2,531,058
1898	4,034,183	387,269
1899	4,335,669	625,793

The manufacture of the knit goods purchased abroad in 1899 would, if made in the United States, require the payment of over $1,500,000 to the employees in our mills, and directly support a population of 10,000.

—The efforts of the Washington Department of Agriculture and others in the matter of introducing and cultivating herds of Angora goats are beginning to show some good results.

Hosiery at the Paris Exhibition.

Specially reported for the Textile World by J. Henry Quilter.

The exhibits of knit goods at the Paris Exhibition are to be found in the "Textile Palace" which forms the left hand portion of the three-sided building in the centre of which is the "Champ d' Mars," to which the Eiffel Tower serves as a never to be missed landmark.

Hosiery goods are included in class 86, and the principal exhibits of any interest are to be found in the French and Italian sections, the former having by far the greater exhibit of knitted goods, which are of such a character as to clearly and without mistake show the capabilities of the French manufacturers. Before dealing with these exhibits in detail, one naturally expects to see everything at its best in such an exhibition, and at the same time give a little margin to the special care and devotion that has been bestowed upon all the special samples shown. Such were the writer's ideas, when entering this section of the exhibition, but these were soon changed when, by the kind invitation of one of the chief exhibitors, a visit was paid to the warehouse, and all similar goods were found included in the range of present season's samples. It is unusual at such exhibitions to find anything absolutely new, but here there are certainly one or two striking combinations in connection with the knit goods exhibits, the more striking of these being the combination of knitted and lace fabrics, not hosiery lace, as produced upon the bearded needle frames by a system of openwork; or that made as net upon warp knitting frames, but such lace produced by a system of twisting in imitation of real lace and of such laces as are made upon the Leavers lace machine and similar machines.

Two exquisite examples of this combination are shown in the exhibit of L. Tribout, Paris, the combination being lace and knitted net, as produced on the warp knitting machine, alternating in spiral stripes of 1½ to 2

inches in width throughout the stocking, the real lace being white and the knitted net black, the effect was extremely neat and pretty.

A second example was a ladies' hose of similar combination, in which the stripes were vertical, the lace stripe having a neat floral design running in spray throughout each stripe. The predominant style of this combination was a plain knitted stocking in silk, wool, etc., having a lace insertion put in down the front of leg and ankle, the designs and combinations of color being varied in the different exhibits, a pale blue knitted stocking with white lace insertion and another in D K blue with black lace being very striking. In each case the knitted fabric was cut away and the lace inserted to wholly take its place, the lace extending from the toe at the one end to just below the knee at the other end.

Numerous similar effects were obtained by such principles as the knitted stocking being kept intact, and a lace design put over same in similar shape of design and combinations of color. By far the more effective result was obtained by a combination of the two latter systems. A lace design of close and openwork being put on the knitted fabric, and where the portion of lace design was an open one, at this point was the knitted fabric cut away in shape of lace design. To the practical observer the apparent difficulty was the retaining of the knitting in shape while being cut away, and the lace insertions made; but there appeared no apparent difficulty, and the making of these designs was perfect, and an example of fine art of the worker, whose patience must be greater than the average worker.

The effect of a lace design in leaves, sprays, flowers, the latter in raised design, the whole being put upon the knitted fabric as though it were made there, was quite unique. Hand embroidered stockings and half-hose were plentiful, but some of the patterns were most beautiful in design and combination of color. It is usual to use floss silk for this purpose, but a departure was made from this in not a few cases, where a portion of the design was produced by narrow silk ribbon instead of the floss silk, the effect of this being, that that part of the design stood more prominent, and in case of flowers, etc., produced a much more novel effect than ordinary embroidery.

Silk embroidery with tinsel was also a common exhibit, but this principle in the writer's opinion is not so neat, though it may be more gaudy.

Quite a number of specialties were shown in gentlemen's half-hose, socks, etc., fancy designs produced by a combination of warp weft knitting being very numerous. This principle of knitting is apparently a large trade with French knit goods manufacturers, and considerable skill is displayed in the combinations of colors, one example among the exhibits of Messrs. Mauchauffee of Troyes being among the most effective, and another sock on the same exhibit, a combination of plain and zigzag knitting, is worthy of more than a passing note. This was a stripe pattern, consisting of a stripe about 1¼ inches wide at intervals of ¾ inch apart; each stripe was divided into 3 parts, forming 3 distinct zigzags, each about 6 needles wide, with colorings as follows: No. 1 design, ground color tan, with 1st zigzag alternate, black and black and white mixture; 2d, zigzag reversed, viz., black white under black and black under black white; 3d, same as No. 1, each being commenced and finished with a yellow course. No. 2 design was gold with gold and white on a violet ground, and No. 3 design red white with red on a D K Brown ground, the style of stripes being all similar.

A specialty in half-hose was plain legs with fancy warp weft design tops, and also half-hose with embroidered designs, extending from the end of top down the leg for some 2 inches, some of these latter designs being very effective.

Another special feature of the

French Bonneterie Exhibits was the adaptation of fleecy fabrics to garments of various kinds, 1st using the ordinary single fleeced fabrics as made on French Circular Frames; and 2d, a special double fleeced fabric made apparently on the double rib warp loom machines. These latter have vertical and horizontal combinations of threads, producing plaid and other similar designs in colors.

One exhibit makes a specialty of white fleecy hosiery, made up into children's goods as gowns, capes, etc., these being embroidered in white silk in very nice designs. Another has ladies' cloaks and jackets, the cloaks being made in the latest styles with stand up large collars and tastefully trimmed. They show also a very fine collection of fleecy webs of different colorings and designs. But without doubt one of the finest exhibits of this class is that of P. Comet, who shows evening dresses, cloaks, etc., exquisitely finished. The adaption of this class of fabrics for such garments as are shown in the various exhibits is a feature of interest to this branch of the trade, showing, as it does, quite a new department of our industry.

G. Boubon & Fils, Troyes have a nice exhibit of white cotton underwear, the shirts, vests, etc., having neat flower designs worked in, by using different colored thread at alternate courses, this being laid over the required number of needles at any course on the thread layer principle.

Quite a special feature is noted in underwear with fancy warp and weft knitted collars, cuffs, bands, etc., the remainder of garment being of plain knitted fabrics in various colors.

One cannot give in detail the whole of the various specialties to be found in this the French Bonneterie Section, which embraces between 40 and 50 separate firms' exhibits, but at the same time it must be mentioned the special exhibits of underwear made in silk, woolen, lisle, etc., made in neat plaited design from circular fabric, made on such frames as the French Circular frames, where the two threads are worked together, and change from back to front, and vice versa, to produce designs either by the change of the position of the thread guides by electrical movement, or by the use of special designing sinkers.

In the Italian section are a few exhibits of knit goods, but these exhibits do not show the taste of the French exhibits, and here quantity is more the feature than quality, and the exhibits are spoilt in consequence. A specialty of particular interest is however shown in this section by Fratelli Bosio in knitted fabrics with printed designs; they are of particular note, being a gray colored fabric with a printed design of imitation lace net embroidered on the Plauen lace, the net and pattern being printed in black, the effect being of a dress with an overskirt of lace.

Germany shows no exhibits of hosiery of interest, nor do the English; a solitary exhibit by J. & R. Morley in this latter section being all the writer could find, and this scarcely worthy of the name it bore.

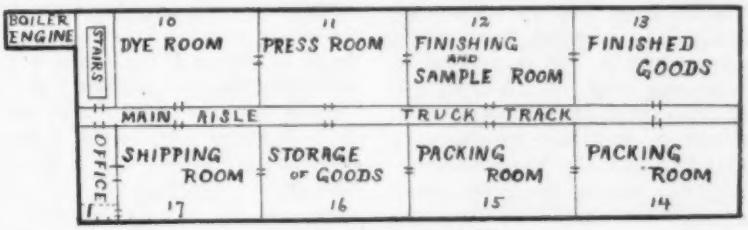
Many other exhibits of interest to hosiery manufacturers are to be found in this and other sections, the Italian silk exhibits and the various spinners' exhibits being very fine; but to study all would require not only months of time, but strength and nerves above the average. Many ideas are to be obtained, however, by those who content themselves to devote their time to those exhibits which are of particular interest to them.

New Knitting Machine Devices.

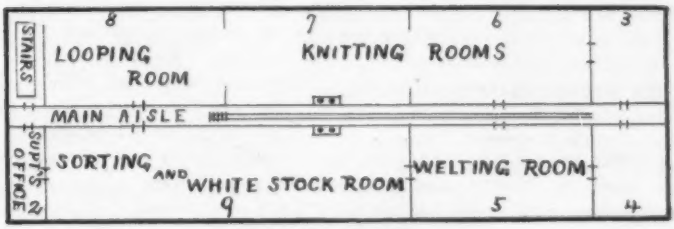
There has been designed a machine for knitting mittens, sweaters, gloves, and other articles in such a manner that either a single tubular portion of the article can be knitted or separate tubular parts at the same time. For instance, in a mitten the wrist portion can be knitted, then the thumb and finger portions simultaneously and properly spaced, or in the case of a sweater the body portion can be knitted to the sleeves, then the two sleeves simultaneously, and finally

the remaining body portion to complete the garment, with the crotch at the joint of the single tubular portion and the separate tubular portions knitted and closed automatically. This machine relates to those having two straight rows of needles, arranged on opposite sides of the machine, and between which passes the work.

There has also been designed, a machine for producing rib knitted fabrics, having one or more vertical stripes therein, each composed of an independent yarn, forming a chain of stitches, interlocked with the stitches of the knitted fabric. It is more in the nature of an attachment to the ordinary circular rib knitting machine. It can, however, be applied to plain knitting machines, without dial needles, and independent for producing ordinary single knitted fabrics.



FIRST FLOOR



SECOND FLOOR

PLAN FOR A HOSIERY MILL.

Plan for a Hosiery Mill.

My idea of a hosiery mill with a capacity of 500 dozens per day would be a building two stories high, at least 400 feet long, and 50 feet wide.

The main entrance and exit should be as near the main office as possible, and I advise the use of elevator stairs in place of the ordinary stairway or direct lift elevators. By this means the operatives can ascend and descend, and cases, machinery, etc., can also be moved by the same means. This elevator stair, as we call it, does not occupy any more space than the ordinary stairway, requires very little power, and is very convenient. Toilet rooms should be placed at each end, or centre of the building, upon each floor, thus avoiding the long distance to be traveled if they are placed upon the outside of the building. The accompanying diagram illustrates our idea of the arrangement of the rooms, by which the raw material, taken in at one door, will move from one process to another with as little handling as possible; this is an important point, as the cost of manufacturing in many mills is materially increased by the inconvenient arrangement of the rooms, necessitating much labor for transportation from one department to another.

The office (No. 1) is on the first floor, and the room above it (No. 2) can be used for the superintendent's office.

When yarns are received, they are carried up by the traveling stairway and placed on trucks, which are run through the centre aisle on each floor. These trucks carry the yarn to rooms 3 and 4, where it is stored. These are easily accessible to the welting and knitting rooms. From the welting room, the tops, or legs, are carried to the knitting rooms 6 and 7. From there the goods go to the looping room (No. 8), and then to the sorting room (No. 9), which is also used for the storage of white stock before coloring. There the goods are taken down to the dye room, where they are colored and turned, and then taken to the pressing room (No. 11). From now on, extra care should be taken to keep them clean, until they are presented to the customer over the retail counter. After leaving the press room, they are taken to room No. 13, where they are stored. From this stock, the orders are made up for shipment, as fast as ready.

SEAMLESS.

The Knitting Industry at Troyes, France.

A strike has been at its height during May, at Troyes and vicinity, nevertheless, public opinion has been very little occupied by it. This is owing to the fact that the importance of affairs in this industrial centre is but slightly recognized. Nevertheless, this industrial population is not unfortunate.

There are few industries in France, says L'Industrie Textile, in which the work is so well paid for as here. On an average, the men earn six francs per day, the women three and one-half francs, and the children from two francs to two and one-half francs per day. Now, in each family, father, mother and children work at the mill. That means for the family a daily wage of from twelve to thirteen francs. Unfortunately, this life, passed almost entirely at the mill, is destructive to the home. The moral dangers are great, and want of foresight causes much misery. Consequently, labor agitators find a good field to work in, but this working population, coming so recently from the country, has retained a strong character, which accounts for the resistance offered to these agitators.

The origin of the knitting industry at Troyes is comparatively recent. The transformation from working in the homes widely scattered throughout the country to the great swarms of workers gathered in factories and operating machines, has been recently effected. The machines in the houses are now rarely found. In order to find traces of the former industrial methods, it is necessary to go far into the country, or to the Halle de la Bonneterie at Troyes, a large building surrounded at the ground floor by barred windows. Through these bars can be seen the packages of socks and knit underwear. Into this building formerly came all of the merchandise manufactured in the little shops throughout the city and country. They sold them there to brokers and local merchants. Much too small formerly, the hall is now too large for its requirements. The upper stories are not used, and there are numerous empty spaces in the lower galleries. Nevertheless, several manufacturers still retain their location at this depot.

It is about 150 years since the knitting industry was begun at Troyes. It appeared in 1751. Then they could not find workers to run the machines, and it was necessary to employ the inmates of the orphan asylums. Several dealers in cloth, and weavers without work consented finally to start knitting in the city, but they remained in the minority. Before the Revolution, there were only about 500 machines at Troyes. On the other hand, the inhabitants of the country finding in the knitting machine the remuneration refused them by a sterile soil, formed an important nucleus of knitters. There were more than 1700 of them in the little communes of l'Aube at that time.

The circular knitting machine, which was to modify the industry so greatly, appeared in Troyes in 1833, and adapted to the local necessities by a Trojan clock maker, M. Jacquin, produced attractive articles and the production of underwear was begun. From that time, Troyes marched forward with a giant stride. About 1346 it had reached the front rank, and henceforth the knitting industry became thoroughly established there. Her shrewd manufacturers began early the making of goods in large quantities, and the number of hand machines rapidly diminished. There were 10,401 in 1864, in that region, and today there are not over 2352, against a total of 9102 machines, divided among 159 establishments. American cotton to be spun at Troyes comes by way of Rouen, but the industry obtains the greater part of its yarns from Vosges and the mills of the North.

Notwithstanding the competition of the foreigners, Stuttgart and Chemnitz, in Germany, Leicester and Nottingham in England, Troyes still remains a great export market, and the heads of leading manufactories there are partisans of free trade. In France, Roubaix has commenced to make similar fabrics to those made at Troyes, but Troyes remains mistress of the market in South America, the United States and the Far East. One mill exports each month an enormous quantity of knit goods to Indo-China.

Some mills are very large. One of them employs 1500 hands in the mill itself, besides 2000 employed in the country to finish the knitted articles; that is to say, sew them together, mend them, and put on the buttons, etc. In order to respond to the needs of their customers and to the tastes imposed by fashion, it is necessary to employ very strange colors, sometimes harmoniously blending, and at other times quite the reverse. Wild, freaky colors, sombre shades, smooth effects, and rough, hairy surfaces are mixed together in the most extraordinary and most charming of disorders.

The knitting industry has been thoroughly relieved from the ridicule of which it was formerly the butt. It is now an art of unequalled grace and originality. To satisfy the changing tastes of the public, machinery and chemistry have done wonders. The industry was enjoying great prosperity when the strike occurred, and it cannot be said that this prosperity has yet come to an end, but though the storm has been brief, it has not failed to cause suffering, and the Troyes industry will be lucky if its competitors have not profited by this strike, to seize upon a part of the markets which have been so patiently developed by thirty years of strenuous labor.

Bleaching Knit Goods.

The process of bleaching fibres, whether animal or vegetable, requires great care in order to prevent injury to the fibre itself. With the exception of bleaching by exposure to the sun's rays, no process is known by which the natural coloring matter in animal or vegetable fibres can be removed without some risk of injury to the material itself.

Whatever method may be adopted, it is essential that the material should first be thoroughly prepared by a careful boiling in alkali solution, to rid the fibre of all soluble matter, so that the bleaching solutions may come in direct and easy contact with the natural coloring matter, which is to be removed.

Chloride of lime is a cheap and efficient bleaching agent, which has long been in use for cotton goods. It is essential after using it to remove every trace of the chlorine from the goods, by passing them through an hydrochloric acid solution, and afterwards thoroughly removing the acid by scouring, as any chlorine or acid left on the fibre is liable to cause serious injury. The bleaching process itself in simply the care and skill re-

quired in the preparing and finishing operations referred to.

In this method, the goods which have been cleansed, are introduced for about an hour into a cold solution of chloride of lime, standing about 1½° Tw. Warm solutions act quicker, but are liable to tender the goods. Then the material is passed through a weak solution (about 1° Tw.) of hydrochloric acid for say 10 minutes; and afterwards thoroughly washed to remove any trace of chlorine or acid. An anti-chlorine compound is often used with good results in place of the acid, as it is claimed that it has no injurious effects on the fibre, while neutralizing the chlorine residue as effectually as does the acid process. One who has successfully employed this compound, writes us as follows:

Perhaps more care is needed in bleaching cotton knit goods than almost any other class of cotton goods. How to make a good white and still retain the strength and "soft feel," has been a source of much anxiety to many bleachers and manufacturers. To produce a satisfactory white is comparatively simple. The other features are where the difficulties lie.

Clean, pure water, is always essential for best result. Water should be analyzed and its properties learned. Where much iron is evident, it will be quite impossible to be certain of uniformly good results. If water is dirty, containing vegetable matter, etc., a good investment would be the introduction of a filter.

The chloride of lime process is still in general use, for bleaching all cotton goods, it being the cheapest, easiest, and making the purest white of any process known. How to bleach with chloride of lime and eliminate the common points of danger, has been a study for bleachers, and those interested in the subject for many years.

To knit goods manufacturers the subject is of special importance. Both chlorine, the bleaching agent, and sulphuric acid, the long time common agent used to "kill" the chlorine, are both dangerous elements to deal with. The chlorine must be driven off, and where sulphuric acid is used for this purpose, it, too, must be removed, and herein lies much uncertainty and danger.

As many bleachers have experienced: to use sufficient acid to thoroughly destroy the chloride, means too much acid for entire safety and soft feeling goods. Sulphate of lime has been formed upon the fibres. This leaves same harsh, particularly objectionable for knit goods, and softening material is required to overcome this feature as much as possible. Soaps are often used, but a soluble oil made from pure castor oil is better adapted for this work.

A substitute for acid is offered on the market in B. & L. Anti-Chlorine. If this will do what is claimed for it, knit goods manufacturers will appreciate it decidedly, and welcome it as a valuable acquisition to their bleaching process. It is said to thoroughly kill the chlorine, and not having the least tendency to weaken the cotton, and forming no sulphate of lime, the goods are left well bleached, strong and soft.

Almost every bleacher has points in his bleaching process which are some different from any body's else, and no doubt he is well entitled to these, there being no teacher like experience, and different kinds of goods and different facilities for handling make the various methods of treatment quite necessary, when it comes to details, but certain fundamental rules should be observed.

1st. Good, pure, clean water.

2d. A thorough boiling out of goods in an alkali bath before bleaching. Some use soda ash, pure alkali, caustic potash or caustic soda. The latter being most common, 2 lbs. being sufficient for 100 lbs. of goods, and boiled for 5 or 6 hours, using enough water to well cover the goods, which should lay loose.

3d. A thorough rinsing from the boiling out bath, making sure to have no soda left in the cotton.

4th. Bleaching in a clear bath of chlorine liquor, some using ¾° Tw. for 8 to 10 hours, some as strong as 2° Tw. for 5 or 6 hours. Coarse or fine yarn should make a difference in this respect.

Bleaching cold is generally considered preferable, though good results may be produced bleaching at a temperature of 110° F.

5th. A thorough rinsing in running water out of the chlorine bath.

6th. An anti-chlorine bath.

7th. If sulphuric acid be used for the anti-chlorine bath, use extra care to thoroughly rinse in running water from this bath, and then give

8th. A bath of soap, including 1 lb. sal soda to 100 lbs. of goods.

9th. If B. & L. Anti-Chlorine be used for the anti-chlorine bath, rinse in a bath of cold or warm water, using bluing in this bath, no soap bath being necessary, but if an extra soft feel is desired, give goods an after bath containing 2 lbs. of pure soluble oil for 100 lbs. of goods. Bath to be at temperature of about 130° F.

The great liability of injury to the goods with the chloride of lime process makes it very desirable that an improved method should be discovered, and recently the process of bleaching by peroxide of sodium has come into prominence. In this process fully as much care is required as with the chloride of lime, in order to preserve the right degree of alkalinity in the bath.

Peroxide of sodium is a grayish white powder which dissolves very rapidly in water, evolving much heat. Being a powder, it is conveniently handled, and retains its strength for a long time. Care should be taken not to allow it to come in contact with wood, or other organic matter, as it is liable to set such materials on fire.

Chloride of lime cannot be used in bleaching wool goods, on account of the injury which it causes to the wool fibre. Peroxide of sodium is not open to this objection, and is, consequently, well suited for bleaching of wool or cotton and wool mixed goods. Dr. Valtmer, a German authority on the use of peroxide of sodium, says:

Peroxide of sodium is nothing but a concentrated, very cheap peroxide of hydrogen, and all the advantages of the latter are also present in the former. The bleacher is thereby his own manufacturer of hydrogen peroxide; he simply orders a few boxes of sodium peroxide sent, and with them he can prepare as much material as if he had a large number of carboys of fluid hydrogen, because the sodium yields in dissolving fourteen times its own weight of commercial hydrogen peroxide, which contains only about three per cent. actual hydrogen peroxide in 97 per cent. water. Peroxide of sodium, when dissolved, dissociates into hydrogen peroxide and caustic soda, and in order, therefore, to neutralize the alkaline property of the latter, certain acids or salts must be added, for which purpose sulphuric acid and epsom salt are most appropriate. This done, the bleacher has after this operation the ordinary commercial peroxide of hydrogen. Since sodium peroxide represents fourteen times the quantity of hydrogen peroxide, it is one-half cheaper, and to this merit must be added the others, that it is far more easily transported, and will keep for an unlimited time. The various tedious processes connected with the manufacture of hydrogen peroxide are dispensed with, and the bleacher has in the dry substance before him a direct water-soluble metal peroxide.

As regards the bleaching materials, the bleaching processes must be altered according to the nature of the former; the concentration, temperature, the degree of alkalinity, and the preparing and finishing treatment of the material are sometimes of great importance. It is hardly necessary to mention that either wooden, or at most, earthen receptacles, can be used for both the sodium peroxide and hydrogen peroxide baths, because either of them corrodes metal, in consequence of which the dissolved metallic parts will soon cause a decomposi-

tion of the bath. The same effect is also produced by impurities, for instance, iron in the water, for which reason water containing metals in solution must not be employed.

The temperature in which the bleaching operation is to be effected is best established by experience. It is well known that silk withstands a far higher degree of heat than wool; for instance, chappe can be heated to 122-144° F., wild silk to 176°, 194°, and even up to 212° F., while wool will not stand a higher temperature than at most 140° F. The higher the temperature is raised, the quicker, naturally, progresses the bleaching operation.

Another authority, which has employed the peroxide of sodium process, gives the following particulars regarding this method:

"Great stress is laid on a thorough preliminary cleaning, for which, if necessary, even caustic potash may be used with discretion. At all events, none but potash soap should be employed. The bleach bath is made up for 100 lbs. of goods, by mixing ½ lb. sulphuric acid, 66° Be. into the necessary water, dissolving separately, 2¾ lbs. oxalic acid, and add to the bath, then stir in 2 lbs. peroxide of sodium, and lastly, make alkaline with 2 lbs. of silicate of soda. Enter goods, warm to 110 degrees F., bleach 2 to 6 hours, wash thoroughly, give 5 minutes in a sour bath, of 110 gallons water and 8 lbs. oxalic acid, wash again and dry. The silicate of soda may be replaced with 5 lbs. Marseilles soap.

"The bleach bath is restored for the next batch by the addition of one-half the above chemicals with the exception of the silicate and soap. Nothing has yet been found to equal the peroxide for bleaching qualities and peroxide of sodium is recommended only because it is the cheapest and most convenient variety."

The cost I will place as follows:

½ lb. sulphuric acid, ½ cent; 2¾ lb. oxalic, 19¼ cents; 2 lbs. peroxide, 90 cents; 2 lbs. silicate soda, 4 cents.

Add about 55 cents' worth of the chemicals for the second hundred pounds of goods, and 8 lbs. oxalic—about 56 cents' worth—for the sour bath, serving both lots, and we have $1.12 for the bleaching chemicals for 100 lbs. of goods, which, I think, is a very low cost indeed, when we consider the little handling called for by the process.

The cost of the peroxide bleaching is thus brought down to very nearly the cost of the old lime or sulphur treatment.

Sulphur is employed for bleaching wool goods, either by exposing the goods in a closed room to the fumes from burning sulphur, or by the more convenient method of immersing the goods in a solution of sulphurous acid for twenty-four hours and afterwards washing and drying; bisulphite of soda is used frequently in place of the sulphurous acid. A bisulphite solution standing about 20% Be. is prepared, and the woolen goods immersed for 12 or 15 hours, then wrung out, and passed into a sulphuric acid bath, standing at 4° Be. for about 12 hours.

This process cannot be used on cotton or mixed goods on account of the danger of injury to the cotton by the acid.

The bleach obtained by sulphur is not permanent. Washing with soap or exposure to the air restores the original shade.

(To be continued.)

[The conclusion of this article, which will appear in the August issue, will contain a very valuable contribution from a successful bleacher of knit goods, on the best methods and apparatus in use at present time.]

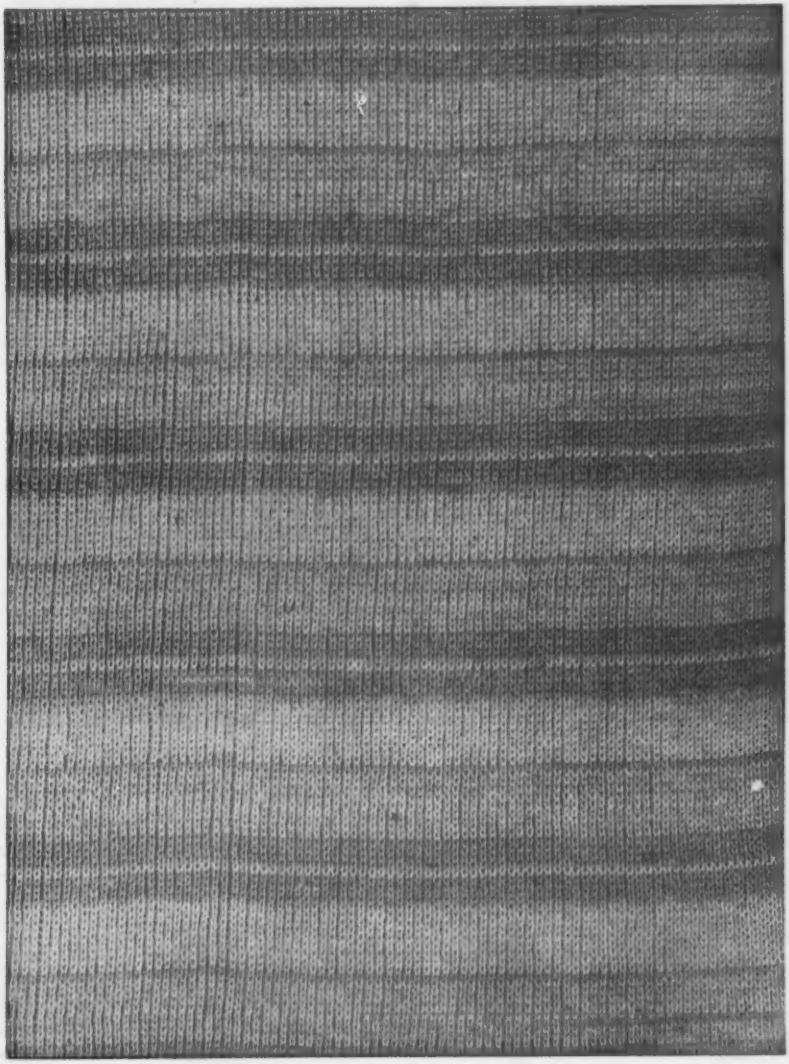
—If all the dressmakers known to exist in America worked 24 hours of each day for a whole year, without stopping for sleep or meals, they would still be able to make only one dress apiece for less than seven-eighths of the women in America.

—The deepest truths are but read between the lines, and, for the most part, refuse to be written.—Alcott.

Points on the Leighton Circular Knitting Machine.

The Leighton Circular Knitting Machine, built by the Leighton Machine Co., Manchester, N. H., has been coming rapidly to the front, as its merits have become more generally known among manufacturers. It is a type by itself, and its special features are briefly set forth in the following claims:

The necessary quality in the construction of fine gauge machines that the lands, which support the needles should have as much strength as possible. The needle plates, cylinders and cams should be made of the best quality of steel properly tempered.



STRIPED KNIT FABRIC MADE ON THE LEIGHTON MACHINE.

It is also an advantage to have the knitted fabric pass down over the exterior of the cylinder, as this enables the operator to have a good view of the fabric, as soon as it is formed by the needles. Any imperfection can be at once detected and remedied, saving much waste. This is also an advantage when knitting samples and trying new combinations of yarns.

It is essential in machines having two sets of needles, that the needles should be accurately adjusted so as to be at equal distances from, and not touch each other, where they cross.

This result is secured by a construction whereby the needles are adjusted by means of screws, and the web passes in full view of the operator, and at same time need not be cut in order to examine and adjust the needles.

It is also an advantage to have the cylinder and take-up stationary, as the work can be easily examined and taken away from the machine at any time.

The yoke that supports the needle cylinder is often mounted on pillars, which are liable to spring, and it is considered an advantage to have this yoke fastened direct to the cam plate.

As regards number of feeds, cylinders under 9 inches in diameter should have from 4 to 6 feeds, and larger sizes 8 to 24 feeds, according to size.

The cams are independent of each other so as to enable any one or all of them to change from tucking to plain stitch automatically, as desired, and the cams should be made so that they may be removed without taking the machine apart.

KNITTING ROOM EQUIPPED WITH THE LEIGHTON MACHINE.

It is also an advantage to have the butts of the needles in plain view and to be able to remove needles at any position without removing keys or blocks to get at them.

Weighted take-ups are preferable to springs, as they can be adjusted more closely.

The oil cup is under the cylinder to prevent goods from being soiled. Stop motions are provided so as to stop the machine if a needle breaks, or if the thread breaks, thus preventing work from being run off.

Latch openers for the needles are advantageous, as they prevent drop stitches, and aid in setting up the

work. The pattern chain does not affect the adjustment of the cams, but, as it should merely determine the position at which the stitch is changed.

The number of needles per inch for underwear varies usually from eight to twelve. Ten needles per inch has the advantage that with it various weights of goods can be made without change of cylinders. Yarns from number 8 to 20 producing good fabrics on ten needles to the inch on the flat head type of machine. The multiple feeds from 14 feeds up give a great range of effects in striping, etc.

The strain on the yarn is materially reduced in this machine by the manner in which the stitches are formed, each one being almost completed before the next one is started. As one knitter, who has worked on the Leighton, says: "I can use as tender yarn on this machine as will unwind from the bobbin. I have frequently knit yarn without difficulty on the Leighton, which was so tender that it was necessary to tip the bobbin in order to get the yarn to unwind."

A striped knit fabric made on the Leighton machine is shown in Fig. 1, while Fig. 2 is a view of a room equipped with the make of knitting machinery.

Retaining Lustre on Mercerized Hosiery.

Editor Textile World:

We beg to thank you for assisting us in the dyeing of tan on hosiery, and would now like to know how to get a high silk lustre on fast black hose knit from mercerized yarn. We have tried it with some soaps and also with various pressures in finishing, but do not get good results. Can you advise us how to handle the goods after dyeing?

SPRUCE.

We believe our correspondent must be killing the lustre by faulty treatment in the dyeing. When fast black hosiery is knit from mercerized yarn, no process is required to give it a high silk lustre, and when properly dyed, nothing should kill the lustre, which is permanent. Of course, if a dyeing process is used that leaves a precipitate of dyestuff on the yarn, or covers it up with some sizing or loose dyestuff, the lustre will be obscured, but it is still there if the extraneous matter is removed, for it is a part of the fibre. Most manufacturers of hosiery finish their goods by hot pressing after knitting. This usually gives an added lustre and materially increases the silk-like appearance.

There are some processes of aniline black dyeing and other blacks which will leave a precipitate upon the yarn, which will naturally obscure the lustre. Then, of course, there are different qualities of mercerized yarn. Some is spun from the best combed Egyptian or Sea Island stock, and when properly mercerized shows a very high lustre so that when knit the ordinary purchaser can hardly distinguish it from spun silk. Then there are mercerized yarns from ordinary carded Egyptian or Peeler, which costs a few cents a pound less, and the lustre is less.

We advise our correspondent to be sure that the dyeing process he is using is one that does not leave a precipitate of dyestuff on the goods. He can probably remedy the defect in the material that he already has on hand by thorough rinsing, or, if necessary, boiling off.

Needle Breakage.

To many, the subject of needle breakage seems a trifling thing, but the knitting business depends altogether upon the needle. Millions of them are in use, each one of them making a large number of stitches a minute; and, while it is a small device, it is at the same time expensive and easily broken, and if proper care is not taken, the expense of needle breakage at the end of the year will amount to a large sum.

The modern knitting machines are nearly perfect in every detail of construction, but when the machine leaves the hands of the maker, and is set up in the mill, the responsibility

for its care and operation is transferred to the manufacturer. He turns it over to his employees to run. If the machinist or overseer who takes it in charge is a competent man, he will see that the machine is properly set up and adjusted, and after it is started, he will insist that the operatives do their part in caring for it. A good, careful knitter can do a great deal towards reducing needle breakage, and it is an overseer's duty to see that the knitters are properly instructed and trained as to the care of the needles, and the best way of taking them out and putting them into the machine. There is no rule which can be given for this work. It is a matter entirely of skill and manual training.

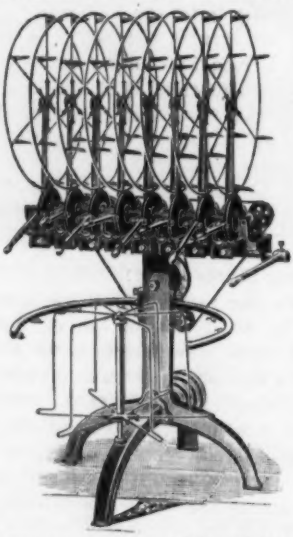
The liability of breakage in the latch needle machine is greatly increased if the needle has been sprung in putting it in the machine. This causes friction on the needle, and results in its getting twisted or broken. It is somewhat different with spring bearded needles, as they have to be sprung and twisted gently when setting them in, and care should be taken in this work, not to injure them. As so much depends upon the operator in the matter of needle breakage, it is a very good plan to keep a record of the breakage of needles by each knitter, and offer a prize, or premium, to the one who has the best record in this respect at the end of each month.

Another hosiery mill manager writes: "Replying to your inquiry in regard to needle breakage, will say that on Southern cotton yarn, our books show for plain seamless work, on a type of machine which I will call A, with 160 needle work, one needle broken to four dozens; on B type of machine, 2½ needles to each dozen. The A machine was working on wool and worsted. The work weighed three pounds to the dozen. The weight is quite a factor on ribbed work, as affecting needle breakage. I should say, that with an average leg weight of 1¾ pounds, the breakage would be a needle to six dozen, and in footing the same, the breakage would be one needle to four dozen. Our footing is all on the B machines, and the ribbed legs are on C machines, which are up to date. The breakage on the ribbed work would average one needle to the dozen on wool or worsted, including leg and foot. The breakage would vary according to the machine used, the size of wire in the needle, and the speed of the machine."

This subject of needle breakage is so important, that we would be pleased to have knitters give us their views on the subject.

A Money Saver for the Knitting Mill.

A new machine now on the market is one designed to ravel and back-wind the pieces of imperfect knitted fabric so that instead of selling the pieces as waste, the yarn of which they are composed is made ready for re-knitting into perfect fabric. It is a machine quite simple in construction and in its operation, and after a little experience an ordinary girl will be able to back-wind into skeins practically all the pieces that have heretofore been destroyed or sold for waste at a very low figure. The machine will handle almost every class of knitted work, such as cardigan, half-cardigan or tuck stitch, plain ribbed or flat



goods, and plated goods. It controls any number of threads up to and including eight. It proves itself especially valuable to manufacturers who use high priced yarns or where a fabric is made of different classes of yarn, as where cotton and silk or cotton and worsted are knit in the same garment. Each separate thread is raveled and wound into a skein by itself even though two or three threads of different material be knit together through one feed.

The machine should pay for itself in a short time. Any manufacturer can compute the saving by comparing the price he pays for yarn and the price he gets for it as waste or seconds.

It is a thoroughly well built machine, occupies floor space three by three feet, weighs 250 pounds, and requires about one-quarter horse power to run it. The speed is completely adjustable without changing the driving belt, and it can be run at such a speed as will best be adapted to the operator and to the material being raveled. It is fully covered by patents taken out in the United States and in the principal countries of Europe.

Further particulars, prices and terms will be furnished on application to Mr. James Taylor, 835 Arch St., Philadelphia, Pa.

A Knitted Fabric.

USING YARN OF DIFFERENT TWIST.

We illustrate a knitted fabric for which a U. S. patent has recently been issued. The fabric is made with rows of stitches of right hand twist yarn, alternating with rows of the opposite or left hand twist.

In one form of the fabric rows of a soft twisted yarn are introduced between rows of hard twisted yarn, thus, two rows would be made with hard right twist yarn, then one row with a soft twisted yarn, (this latter being either right or left), and then two rows with a hard left twist yarn.

The inventor claims that fabrics made of yarn twisted in one direction become easily warped or drawn out of shape after washing, and that his method of combining yarns twisted in opposite directions remedies this fault. He also states that yarn containing more twist can be used, and that the fabric will hold its shape better, and on account of the hard twist the felting or shrinkage, while being washed or worn, is greatly reduced.

The inventor states that the use of

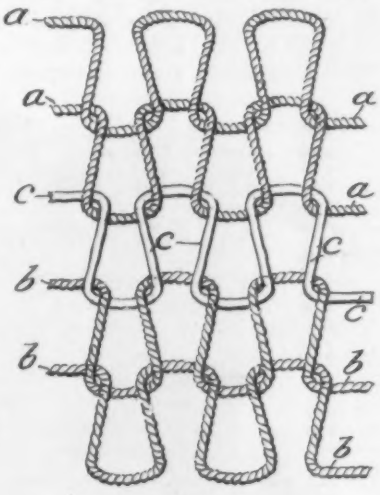


Fig. 1.

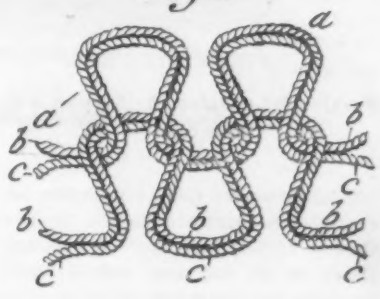


Fig. 2.

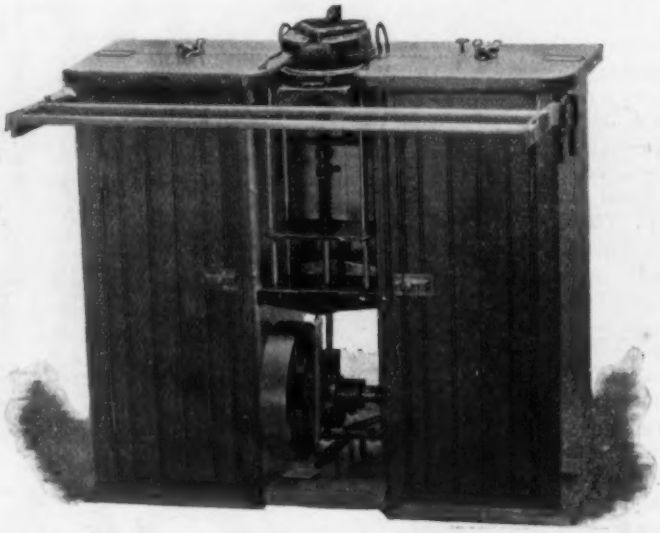
yarn twisted in opposite directions prevents felting by reason of the yarns mutually counteracting each other and preventing the fibres from catching together.

As to this last claim it may be said, that woven fabrics are often made with both right and left twist yarns,

as well as with yarn of but one twist, and no difference in the fulling qualities of such goods has been noticed.

The fabric is shown in Fig. 1, threads a a are twisted to the left, thread c is soft twisted, threads b b are twisted to the right.

Another form of the fabric is shown in Fig. 2, in which the stitch is made by two separate threads b and c, one of which is twisted to the right, and the other to the left.



Machine for Shaping the Neck in Knit Underwear.

A machine for this purpose has recently been invented by D. L. McCreedy of Sauquoit, N. Y. It is enclosed in an oak case, and is three feet long and thirty-one inches high.

The machine is built to take the place of hand work in shaping the neck on underwear. It is automatic in every particular. In knitting mills all work is handled in dozens. A dozen of shirts are laid over a steel rod running parallel with the cabinet, as shown in the accompanying illustration.

The tops of the garments are taken up one at a time and placed between two burnished brass fingers that clamp the garment at the junction of the shoulder and sleeve seams sufficient to hold it in position, yet the garment can be easily drawn from them. These fingers can be set for any size desired. A brass rule is inlaid in the top of the table with a pointer attached to the brass fingers nearly over the size in the brass rule. The rule is laid out for 18 sizes, from size 16 to size 50.

Three sizes of garments can be crimped without a change, when the sizes run together, viz: 34, 36 and 38. While the garment is held between the brass fingers a latch is released which straightens out the garment at the shoulder automatically, directly under and exactly in the centre of the neck, when by lightly touching a foot treadle the machine is set in motion, bringing the neck dies together with the garment between them, thus producing a distinct crimp.

The machine works very rapidly, and the inventor claims that six dozen a minute can be produced, providing the operator can handle that amount of goods.

The Eclipse Machine Co., Sauquoit, N. Y., has been formed to manufacture these machines, and the first one will be shipped to the Oneita Knitting Mills, Utica, N. Y.

COTTON DEPARTMENT.

Types of Woven Fabrics.

THEIR CHARACTERISTIC FEATURES, CONSTRUCTION AND MANUFACTURE.

ARTICLE VII.—COMPOUND DAMASK FABRICS.

HARRY NISBET.

(Copyright.)

Compound damasks are of two classes, namely,—(a) in which an additional system of weft, and (b) in which an additional system each of warp and weft is employed, with the object of producing fabrics of greater strength, bulk, and weight, than those of simple texture; and which are, therefore, better adapted for the purposes to which they are intended to be applied, as curtains, hangings, and upholstery. The extra system of weft in both classes is employed as a "backing" weft only, playing no part whatever in the scheme of decoration, and consists of a full-bodied yarn of linen or other non-elastic fibre, to give a good foundation to the fabric, and prevent the latter from stretching.

The extra system of warp in class (b) is employed for binding purposes only, and like the extra weft, plays no part in the development of figure.

To all outward appearances, when seen on the face side, compound damasks are similar to those of ordinary construction; and it is only by a close inspection that their compound character is revealed. This arises in consequence of the "backing" weft being so effectually concealed at the back, and also by being dyed the same color as that of the warp.

Warps are generally made from organzine silk, or else spun silk of one color, picked with face weft of tram silk of another color. When an extra binding warp is employed, it should be of exactly similar material, and of the same color as the figuring warp, although it must be wound upon a separate warp-beam, as its contrac-

FIG. 36

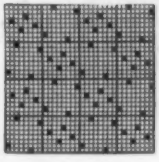
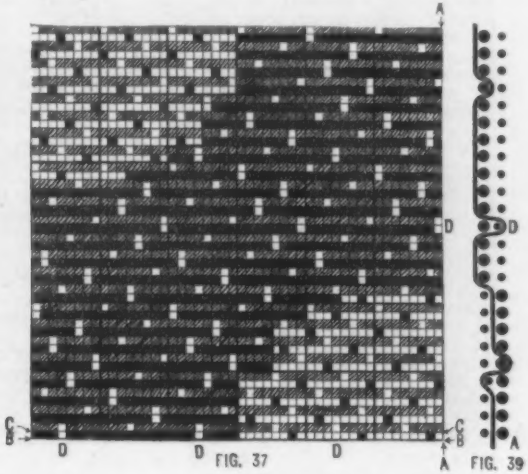
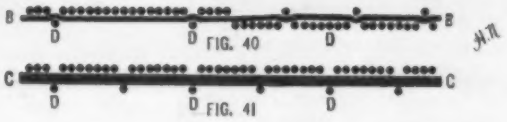


FIG. 38





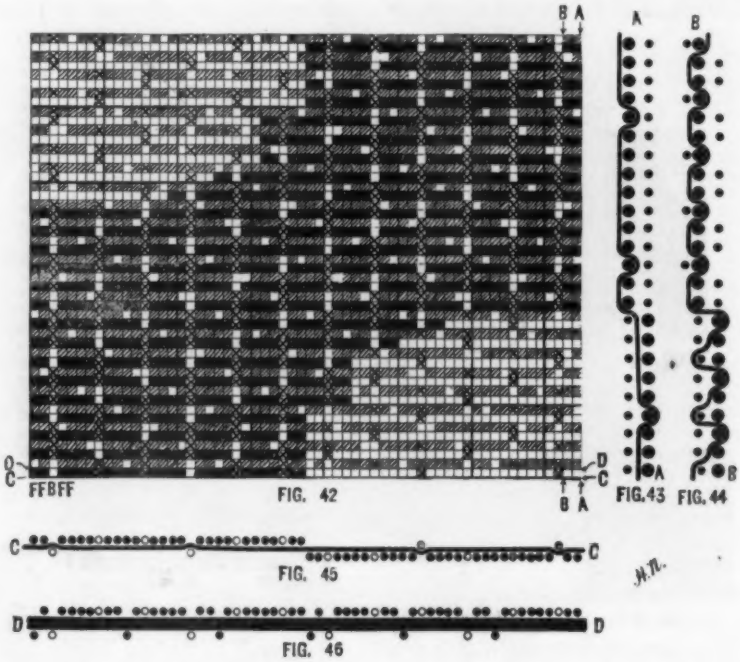
tion during weaving is about 12 per cent. greater than that of the latter.

Warp ends are controlled in groups for the development of pattern, and individually for the purpose of interweaving them into the body of the fabric in some definite order; also, two picks are inserted for each pattern card, namely,—one face and one back pick alternately; thus requiring the use of looms provided with two shuttle-boxes at each end of the sley, a box-motion, and also a pick-and-pick motion.

The construction of a typical example belonging to class (a) is shown by Figs. 36-41. Fig. 36 is a portion of a design prepared en bloc, in the usual manner. Each vertical space on design paper represents four warp ends, and each horizontal space, two picks, namely,—a face and a back pick.

The actual order of interweaving is shown in Fig. 37, where black squares indicate warp, lifted over face picks; and shaded squares, warp lifted over back picks. In the figured portion of the fabric the warp is raised en masse on the face picks; but one warp end in sixteen is kept down in the manner indicated in Fig. 38, to bind the weft at the back, and prevent it floating too freely.

In the ground portion, one end in eight is lifted on the same picks, to form an 8-end weft satin binding weave on the face side. The warp is raised en masse on back picks throughout; but one warp end in eight is kept down, to form an 8-end weft satin binding weave at the back.



The face weft may be bound in any desired manner, when at the back; but care should be taken to select a method that will ensure uniform contraction of warp ends; otherwise, more strain will be put upon some than upon others during weaving; also, the binding points should be made to come where warp ends have been left down on the fellow back picks, as shown at D, Figs. 37-41.

Fig. 39 is a diagram showing a longitudinal section of the fabric as it would be seen at A, A, Fig. 37; and Figs. 40 and 41 show transverse sec-

tions at B, B, and C, C, respectively.

Fabrics belonging to class (b) are scarcely distinguishable from those belonging to class (a), in consequence of figuring warp ends and binding warp ends being exactly similar. By removing threads from the fabric, however, those of the binding system can easily be distinguished from those of the figuring system, by their highly corrugated character due to greater contraction.

In the example selected for description there are four figuring warp ends, controlled by the same hook, to one binding warp end, which is drawn between them as follows: F F B F F—F F B F F, and so on, as seen in Fig. 42, which shows the actual order in which warp and weft are interlaced for the portion of design Fig. 36. Black squares in Fig. 42 indicate figuring warp ends lifted over face picks, and shaded squares indicate them lifted over back picks. Crosses indicate binding warp ends lifted over both systems of weft. Figuring warp ends are raised or left down en masse, according to pattern, on face picks, which latter do not at any time interweave with them, excepting where they pass from the face in the ground portion to the back in the figured portion of the fabric, and vice versa.

On the back picks, all figuring warp ends are lifted throughout, excepting one in eight, which are left down to form an 8-end binding weave with those picks. Face picks interweave with binding warp ends in such a manner that they form a 3-end $\frac{1}{2}$ twill for the ground portion, and a 3-end $\frac{2}{1}$ twill in the figured portion. This is accomplished by raising every third binding warp end in the ground portion, and leaving down every third warp end in the figured portion, on face picks only; but in order to prevent two separate and distinct cloths being formed in either portion, the binding warp ends are caused to weave a 3-end $\frac{2}{1}$ twill throughout on the back picks.

This will be more clearly understood by reference to Figs. 43-46, which show longitudinal and transverse sections as would obtain if the fabric were woven according to design Fig. 42. Figs. 43 and 44 are sections at A, A, and B, B, showing the manner in which a figuring warp end and a binding warp end respectively are interwoven. Figs. 45 and 46 are sections at C, C, and D, D, showing the manner in which a face pick and a back pick respectively are interwoven.

Raw Cotton in Japan.

There are 300,000 bales of American cotton and 500,000 bales of Indian cotton used every year in Japan. Of all cotton employed by the mills, American cotton forms 20 to 30 per cent. and Indian cotton 50 to 60 per cent.; but there is a tendency to increase the importation of the American cotton at the expense of the other. It is difficult to say even approximately what the percentages would be next year, as the demand is greatly influenced by the fluctuation of rate; but with the present quotation, it would be something like this: American cotton, 60 per cent.; Indian, 30 per cent.; miscellaneous, 10 per cent.

About 13,000 bales in a month could be imported from the Pacific coast, viz, San Francisco, San Diego, Tacoma and Seattle. But as the steamers generally give space to the cargoes for China, the shipment of cotton is limited. Consequently, the average amount in a month from these ports is about 8000 bales.

Freight has at present risen to $12.15 per ton, but it will come down to $8.99 per ton when the quick-dispatch boats are no longer in demand. As to the rates on cotton imported from America via the Pacific coast, there is an agreement between railroad and steamship companies covering all freight from the time the goods are delivered to the railroads at the place of production to the port of destination. The particulars are unknown to the importers, but the through freight is 1.35 cents per

pound, of which from $7 to $8 per ton will be paid to the steamers.

According to the record of last year, the shortage on the cotton from the Pacific coast was small—about 1 per cent.

If all the mills work full time, even if they suffer some loss in consequence of high price of cotton and bad market for their produce, the demand for cotton will not decrease. On the other hand, if Indian cotton becomes dearer than American, all the mills will use the latter and its importation will increase to the exclusion of the former.

The Sale of Cotton Yarn.

An Address to the Southern Cotton Spinners' Association by Leonard Paulson, of Buckingham & Paulson, New York.

Mr. President and Gentlemen of the Southern Cotton Spinners' Association:—

In addressing you, I cannot refrain from congratulating you upon the changed conditions under which this Convention is held, compared with those prevailing a year ago. Then cotton was high, prices of yarn were low, trade dull and the outlook by no means inspiriting. Today, if cotton is still high, yarns are still bringing profitable prices; business has been and will be good again, and in spite of some doubting "Thomases" the outlook is decidedly encouraging.

Towards this improvement, your association has unquestionably contributed largely. It has consolidated the spinning interests of the South, has removed causes of friction which have existed in the marketing processes, making pleasanter and therefore more advantageous from a business point of view, the relationship of the spinner, the selling agent and the consumer. And in addressing you upon the "Sale of Cotton Yarn," I cannot do better than consider these three interests in the order I have named them.

First. The duty of the manufacturer is simple; it is to deliver merchantable yarns, fully up to the requirements of the order given to him; also to see that he makes his deliveries according to his contract. If he fulfils these conditions, his obligation ceases.

Second. When an agent gives the spinner an order at a certain price, specifying the quantity and quality he has sold and the deliveries that must be made, he has done his part, for which he is to receive a commission of, say, five per cent. This commission guarantees the manufacturer one hundred cents on the dollar and covers all charges (except discount for cash, interest on advances and other fixed charges) after the yarns reach their destination. Should the customer conclude that he does not want any part of the yarn and decide to cancel all or part of his contract, the spinner has nothing to do with it; that is a matter entirely with the selling agent; and if he allows his customer to cancel an order, it is at his own cost; and he has no right to ask the manufacturer to bear any part of the burden. It has already been decided, that when a commission merchant places an order with a manufacturer, the commission merchant receiving a commission for guaranteeing one hundred cents on the dollar, that the manufacturer's obligation ceases after he has made his delivery according to contract. He does not know the customer, and probably doesn't want to.

I understand that some claim when a customer cancels an order, the spinner is responsible, claiming that the commission merchant is acting as agent only. In these enlightened days, that doesn't go, provided the spinner has kept his part of the contract; also providing the agent is receiving a commission for guaranteeing the account. Of course, if the agent is working on a brokerage of one per cent. or two per cent., and does not guarantee, then the spinner has to stand the cancellation; also take the risk of the buyer paying his account in full. But as business is done now and as I understand it and

as we do our business, five per cent. commission guarantees everything after the yarn reaches us. We guarantee one hundred cents on the dollar also that our customers will stand by their contracts; and to do this, all we ask of the manufacturer is that he keeps his part of the contract to the letter. All selling agents should do the same. If they do not do it, it is your place to compel them to do so. It takes two to make a contract; it takes two to cancel it.

It doesn't require a map to explain what a guarantee means. As an illustration, suppose an agent should sell for you one hundred thousand pounds of yarn at twenty cents per pound. After he had delivered fifty thousand pounds, his customer should fail, leaving fifty thousand pounds of yarn on hand or due him. In the meantime, undoubtedly you had secured cotton to produce this one hundred thousand pounds of yarn, and the price of yarns had declined, say, five cents per pound. Suppose the customer makes a compromise with his creditors, we will say for fifty cents on the dollar. The selling agent would certainly not look to you to stand this loss, as he has guaranteed it. Now, would it be fair for him to ask you to guarantee the market on the other fifty thousand pounds? If he guaranteed part of the contract, he certainly guaranteed it all; and if he asks you to accept fifteen cents per pound for the fifty thousand pounds of yarn that he sold for you at twenty cents, he has just as much right to ask you to accept fifty cents on the dollar for the fifty thousand pounds which he has delivered to his customer. There is only one kind of a guarantee and that is to guarantee one hundred cents on the dollar on the entire contract. He guarantees all or nothing. "What is sauce for the goose is sauce for the gander."

Please do not understand me to say that there cannot be any cancellations, for there are times when you must accept them from your agents. If you do not make your deliveries on time as agreed, and also keep the quality of your yarn fully up to the requirements, the customer has a perfect right to cancel his contract; and you must accept the cancellation from your selling agent.

At this point I want to explain something that some manufacturers do not appear to understand. That is, the three and five per cent. Quite a number have said to me, "You agents get three and five per cent. or eight per cent., for selling yarns." This is not the case. The discount of three per cent. for cash in ten days goes to the buyer, and is in fact a part of the price, leaving the agent only five per cent. for expenses and guaranteeing, which is little enough. I have been in the yarn business since 1863, and I have never known of a single instance of any agent making enough money to retire; but I could name quite a number who have failed.

Time was when the third interest, the consumers, were regarded by the spinner as ever on the alert to take undue advantages. That impression, thanks to your association, is rapidly dying away. You find that as a class they are honorable business men and stand by their contracts, as all must do. If they get the worst of it, they take their medicine like men; and if they get the best of it, they expect you to take your medicine and look pleasant. They will do everything they agree to do and they expect the same treatment from you. Of course they had a hard time when yarn first advanced; but it might have been worse. They have been getting a fair advance on their production; and if they did not get it, it was their own fault. All of us had contracts at low prices which we were compelled to fill. They also had contracts at low prices which they were willing to fill; and they were also perfectly willing to pay in advance for yarns for their requirements, for the reason they could get an advance for the product of their looms. There are of course exceptions in every class, and there are buyers who will try to lay down

on a contract if it goes against them; but do not let your selling agents tell you that their customers will not take their contracts, and ask you to stand the loss. As I have said already, you have nothing to do with their customers; the responsibility is with your agents. We are willing to stand by this statement and carry it out. I think we have shown in the past that we have done this, and I am willing to stand by every word I have said today.

As to the prices of cotton yarns, I am not prepared to say what the future will be; but I can tell you this, all the spinners of the South as well as the spinners of the East have their product sold several months ahead, some of you being sold ahead until September. Most of the weavers who consume this yarn are also well sold up; in fact, it has been impossible in a great many cases for them to deliver five or ten packages of their fabrics at any price, for prompt delivery. If they told you they could not afford to pay the prevailing prices for yarns because they could not obtain a corresponding advance on the product of their looms, as they were in about the same position as you, unable to fill any orders for prompt delivery, if they sold their production at a loss it was their own fault. A great many weavers have told me they did not want lower prices, as a decline in yarns means a decline in their products. The business of the country was never so good as it has been for the past year. Any line you may take, you will find have been and are now behind on their orders. I do not see the reason for the break, unless it is caused by spinners pressing for orders for future delivery and weak-kneed selling agents forcing sales.

There was an article published in the New York Journal of Commerce on March 17th headed "The Future Course of Prices." It was taken from a circular issued from Boston, in which they say "That the spinner is entitled to a reasonable margin of profit on his production. Anything beyond that is unhealthy and demoralizing both to the spinners' and the consumers' interests. They said that the prices then ruling were simply prohibitive, and the consumer could not pay such values and convert the yarn into goods and get out whole, and they feared it would curtail the consumption of yarn, and the spinners would want orders."

I beg to disagree with the writer of that article, and claim that the values of yarns at that time were not prohibitive; and I also claim, as I have stated before, that the consumer could get a sufficient price for his production to warrant him in paying the prevailing prices of yarns, for the reason that he was sold ahead, and on future orders he was not compelled to accept, unless he could get a profit on the cost of production. Articles of this kind do not help sustain the market. It it were true that the advance in the prices of cotton yarns was unhealthy and demoralizing, then what about steel rails, which have advanced from fifteen dollars to thirty-three dollars per ton, an advance of one hundred and twenty per cent.? What about nails, which have advanced from one dollar and eighty cents to four dollars and twenty cents per hundred pounds, an advance of one hundred and thirty-three per cent.? And what about copper, which has advanced from twelve to eighteen and a half cents per pound, an advance of fifty-four per cent.? What about four-yard sheetings, which have advanced from three and a quarter to five and three-eighths cents per yard, an advance of sixty-five per cent.; and what about print cloths, which have advanced from one and three-quarter cents to three and a half cents per yard, an advance of one hundred per cent.? The cost of producing all these has not advanced more than the advance in the cost of producing cotton yarns. In fact, nearly all manufactured goods have advanced from twenty-five to one hundred and thirty-three per cent. It appears for all these products the advance is sound

and healthy; then pray why is the advance on cotton yarns unhealthy and demoralizing? I must confess, I do not know.

The cost of producing yarns has increased very much in the last year; the loss in waste is much greater; the cost of all supplies has advanced; labor is also higher, and no one can produce yarns at the same cost as they did in May last. The question of the price of cotton or cost of producing does not enter into the price of yarns; supply and demand cover it all. If a consumer can buy yarn at ten per cent. less than cost of production, he will not pay any more. While I do not favor killing the "Goose that lays the golden egg," which is the man who buys the product of your spindles, I think it is only fair to get the best price we can for your production. It doesn't make any difference to the consumer what price he pays for his yarn, whether it is fifteen cents or twenty-five cents per pound, providing his competitor cannot buy the same yarn for less. If they all have to pay a uniform price for yarn, they will get a fair price for their product, consequently, all will make a profit and all be happy.

Having noticed the three interests in the home trade, I desire to draw your attention to another important question coming rapidly to the front in the "Sale of Cotton Yarns" and that is the necessity of looking for foreign markets for the near future. The intense activity in Southern mill building and the increasing stream of projected enterprises must make this imperative. What the home market has done in the past is no criterion of what it may be able to do in the future with such steady and large expanse of production.

The South is well qualified to compete for foreign yarn business. Formerly, a great many of the yarns you are now producing were made by New England mills only. The Southern mills on these numbers are turning out yarns equal not only to those of New England but of Old England also, while in coarse yarns the South can beat the world. There is a large foreign demand for cotton yarns. Last year England exported $40,000,000 worth, while our total exports of all cotton goods manufactured last year were but $19,000,000. We boast of the progress we are making with that branch of our export trade, and yet our total is not fifty per cent. of England's export of yarns alone. There is no reason why that should be so, provided you spinners will be as willing to comply with the demands of foreign markets in reeling, packing, etc., of yarns, as the cloth manufacturers are in lengths of cuts and packing and other requirements of their customers. Believe me, this is a matter which you cannot afford to neglect, and I cannot better close this somewhat crude address than by advising you to apply yourselves earnestly to the cultivation of foreign markets. They are an elastic outlet for surplus production, a safety valve for the home market to support the values in it.

Improvements in American Cotton Machinery.

GEO. OTIS DRAPER.

Read before the Southern Cotton Spinners Association.

A subject so comprehensive must not expect elaborate treatment in detail, within the limited time afforded to an address of this nature. Whole volumes have been written with reference to certain separate cotton machines alone, and thousands of ingenious inventions have been patented by American inventors in this line, the greater part of which might well deserve at least a passing comment. The restriction of the subject to American improvements alone, necessitates distinction by comparison with improvements not of home origin. Cotton machinery was first developed from former crude hand processes, by English genius, entire mill equipments of semi-automatic machinery having been devised and used across the water, before American inventors attempted competition. As later improvements

have been largely confined to modifications of the basic ideas furnished by the early English inventors, it cannot be properly said that Americans have actually originated any one broad class of cotton mill machine. If we are allowed to go outside the mill, we shall, of course, take pride in the cotton gin, the sewing machine, and the new baling machines, entirely American in character. The term "Cotton Machinery," however, is not usually interpreted as including anything not found in the cotton mill proper. We must be willing, then, to credit the outside world with all the fundamental principles shown in the conceptions of Arkwright, Hargreaves, Paul, Kay, Cartwright, Crompton, Jacquard, Roberts, Heilman, and others, but it is undoubtedly true that the greater part of the important later modifications have been made by American inventors, especially during the last 50 years. In fact, the marvelous quickening of American inventive genius in every line of mechanics has proved to many a marked superiority for the American type of mind. As a matter of fact, however, it is somewhat questionable as to whether artificial conditions are not largely responsible for this showing. The English patent system, for instance, denies their inventors the same protection awarded by our own government, and English capitalists are more conservative in backing new enterprises. The fact that the most important of our modern textile improvements was developed from the ideas of a transplanted Englishman, Mr. James H. Northrop, and the most recent possibility by a Frenchman, Mr. Victor Belanger, shows that we must not be too sure of our superiority in mechanical evolution.

If we take the various departments of the mill in turn, we enter at the picker room, to find that American invention has been shown in recent improvements on automatic feeding machinery, and the automatic eveners used on pickers and lappers, are understood to have been of American origin.

Passing to the card room, we must acknowledge that America has made but slight change in the machinery here included, for English cards, drawing frames, and slubbers, are still imported, showing that no American patents are sufficiently important to absolutely guide the purchaser toward the American product. The English revolving flat card has driven out the old American type with the Woodman and Wellman stripper, also the ingenious under flat card of Foss and Pevey. While revolving flat cards are built by many American builders, their general features are palpable copies of original English construction. That purely American idea, the railway head, with the evener of Hayden, has also been largely replaced by the English coiler system. Drawing frames are also English in design, although the change to metallic fluted rolls on these machines and roving frames as well, is due to the American invention of Dunham and McKemmie. While American roving machinery is certainly equal, or superior, to that of any outside builder, the American improvements are largely in design, or modifications of a character that furnish no basis for patent protection.

It is in the next department, namely, the spinning room, that America has not only held her own, but led the world. Leaving the English mule out of the question, we find its competitor, the ring frame, American in every detail, save the original drawing rolls of Arkwright. Here is one instance where England has come to us for knowledge, they being glad to copy our spindles, rings, separators, guide wires, travelers, and general details. The original idea of spinning with a ring and traveler, appears in the American patent of John Thorpe, in the year 1828, being contemporary with the invention of cap spinning, by Danforth, in 1829. The latter idea gained greater headway at the start,

(To be continued.)

WOOLEN DEPARTMENT.

Nature of the Wool Fibre in Relation to its Textile Treatment.

CHAPTER III.

DAVID PATERSON, F. C. S.

We come now to consider one of the most important operations in regard to the textile treatment of wool, namely, the scouring. The natural wool, as we have already learned, contains a large percentage of natural fat or grease, which is termed yolk, and also a quantity of dried up sweat, which goes by the name of suint.

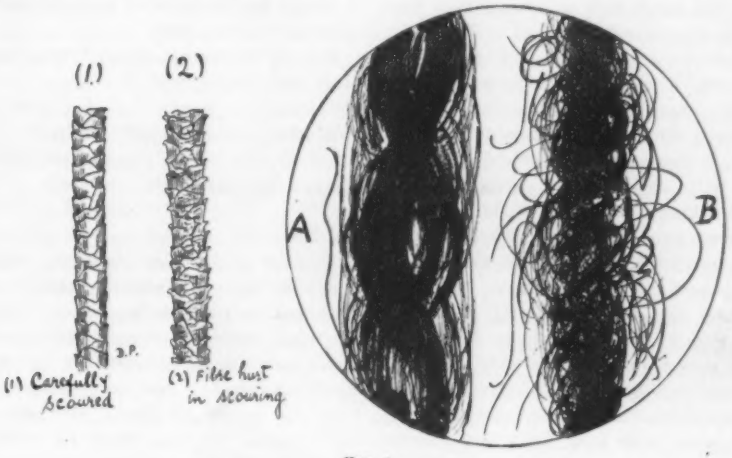


FIG. 1.
No. 1 Wool Fibre Carefully Scoured.
No. 2 Wool Fibre Scoured With Excess of Alkali.
A Worsted Thread Viewed Through Microscope.
B Woolen Thread Viewed Through Microscope.

Before the wool can be employed for textile purposes, like color printing and dyeing, these natural oily products must be thoroughly removed by means of soap or mild carbonated alkalies.

If a fleece of raw wool be washed in pure warm water it will be found that the water, after the immersion of the wool, shows a decided alkaline reaction. This is due to the presence of carbonate of potash (K_2CO_3) in the wool fat or suint. The other fatty portion, i. e., yolk, is insoluble in water, but soluble in most of the light oils, benzine, ether, bisulphide of carbon, etc. In washing raw wool, therefore, if it contains an excess of this fatty matter insoluble in water (i. e., yolk), it will be more difficult to scour thoroughly and will require the addition of more soap and alkali. Such wools are often termed "pitchy." In scouring wools, the two great dangers to be strictly avoided are excessive heat and strong alkalies.

If wool be boiled in water for a considerable time, it will be observed that it loses much of its beautiful lustre, feels harsher to the touch, and also becomes felted and matted together. This has to be carefully guarded against in all dyeing operations, where the handling or moving of the yarns is apt to produce this unfortunate effect.

After prolonged boiling the fibre shows signs of slight decomposition, from the traces of sulphuretted hydrogen and ammonia gases which it evolves.

In scouring, the bath should never be warmer than to allow the hand to be held in it comfortably. If the temperature be higher that that, viz., 100°

to 110° Fah. it is too hot. A higher heat than this hurts the lustre of the wool, impairs the beauty of the fibre, and renders it liable to felt.

An excess of the alkaline scouring reagents also destroys the lustre in a remarkable degree. This is owing to the opening of the outer scales by the agency of the alkali; and if the wool fibre, which has been over-scoured, be examined under the microscope, it will be observed that the scales are ruffled and the beautiful reflecting surface of the fibre is more or less destroyed. The opening of the scales gives rise to the disagreeable property of felting already described, and also accounts for the harsh feel of a wool that has been too severely scoured.

Our illustration (No. 1, Fig. 1), represents the carefully cleansed wool fibre where the outer scales remain smooth and uninjured; while (No. 2, Fig. 1) represents the same fibre treated with an excess of scouring soap and alkali. This fibre (2) feels harsh and unpleasant to the touch, while its former lustre is greatly impaired.

Caustic alkalies, such as soda or potash (Na OH and KOH) have an extremely injurious action on wool, and they should never under any conditions whatever, no matter how dilute the solution, be allowed to come in contact with wool. If a small hank of wool be immersed in a dilute warm solution of such an alkali it gradually dissolves, forming a soapy liquid. This simple experiment shows the great danger of using low class, impure soaps or cheap carbonated alkalies for scouring, which may contain a small percentage of free caustic alkali.

Carbonated alkalies like carbonate of soda or potash, when in dilute solution, have a mild effect on wool, and can therefore be cautiously employed for scouring, in conjunction with the soap. A valuable addition to the scouring bath is ammonia, either in the form of liquid ammonia (NH_4OH) or as sal-volatile, the carbonate of ammonia.

From the very earliest times stale urine or lant has been employed for scouring purposes, its detergent qualities being due to the presence of ammonium carbonate.

The selection of a good scouring soap is always a question of interest to the textile manufacturer, as, on this depends much of the success in the scouring operations. All authorities agree in considering a potash soap to be the best for wool scouring as it has a milder effect on the fibre than a soda or hard soap. Indeed nature seems to indicate that potash is the most suitable alkali for wool, when we consider that the natural wool fat, already spoken of, contains a large percentage of potash salts with little or no soda.

The following analysis of wool fat is given by Chevreul:

Potassium carbonate	86.78
Potassium chlorides and sulphate	9.01
Soda, magnesia, lime, etc.	4.21
	100.00

A good soft soap, therefore, with the addition of a small quantity of ammonia to the scouring bath, forms the best cleansing reagent for wool. Good soda soaps, or what are termed hard soaps, when free from adulteration and excess of alkali, give excellent results for wool scouring, when assisted with the addition of a little carbonate of soda.

Any soaps or alkalies, which, on analysis, show the slightest percentage of "free caustic alkali" must be rigidly avoided in all the processes of wool treatment.

It is sometimes necessary, under certain conditions, to boil wool in a slightly alkaline bath, as, for example, when dyeing with the alkali blues. In such cases very mild alkalies are used, such as borax, phosphate of soda, silicate, or stannate of soda, soap, and such like mild alkaline substances.

The quantities of soap and alkali necessary to cleanse thoroughly the various qualities of wool to be met with in commerce, can only be found

out by experience and careful experiment.

As we have learned, some wools, which are pitchy, destroy more scouring materials than others, and when scouring yarns, the oil added to the yarns by the spinner in the spinning operations, has, likewise, a great effect in altering the proportions of soap and alkali required for efficient cleansing.

The percentage of oil present varies with the nature of the yarns,—worsted yarns having, as a rule, about 10 per cent.; while the woolen yarns average about 15 per cent. of spinners' oil. Short wool fibres, or what are termed "carding" wools, when spun into a thread, or woven into a fabric, form "woolens;" while the long stapled fibres, or the combing wools, produce the "worsteds."

Carding wools have the property of felting readily and are therefore well suited for the manufacture of close woolen materials.

It is an interesting object to view a woolen and a worsted thread through the microscope. In the case of the woolen thread the fibres are seen to be short and curly (see B in Fig. 2), while in the worsted thread (A) the fibres are long and wavy in character.

(To be continued.)

Boiling and Fibre Conditions.

One of the things that every practitioner should be familiar with in the manufacture of textiles is the exact effect and result of every variation of treatment in the various processes of manufacture. One of these processes is the boiling of textile fibres in water. This is attended with results, varying all the way from a most marked improvement of the textile appearance to the destruction not only of the appearance of the fibres, but their life and value. There is no question whatever but that full knowledge of the conditions and a wide range of experience in handling stocks under all kinds of circumstances are required, before such a detail as the boiling in water of textile fibres can be accomplished with safety and success.

To begin with, it may be remarked that it is an exceedingly simple matter to determine by actual experience what the effect of the boiling process would be upon a wool fibre. Take for example a pound or two of loose wool out of a larger lot, and boil it for an hour in good, pure, clean water; after it is removed from the bath and dried thoroughly it can be contrasted with the lot from which it was taken and the results clearly discerned. The apparent effect is somewhat as follows: The boiled wool is more pliable and elastic, and this of course will add to the agreeableness of its handling and feel. It will be found also that the lustre has been brought out in a marked degree, and it will also be seen that the boiled wool for some reason or other will occupy a larger space in proportion to its weight than it did before the boiling took place.

If the boiled wool is immersed in water it will absorb considerably more water according to its weight than it would before it was boiled, and this absorption will take place much more quickly. The reasons for these various results will not be hard to find, and yet it is necessary to understand them before any practical application can be made of the principles in question.

It is quite evident that the boiling in water has served to soften the gelatine-like material which enters so considerably into the make-up of the wool fibre; the result of this fact is of course, a complete change in the structure of the fibre. Since this gelatine-like material is of a gummy nature, it necessarily renders the fibre hard and harsh. When this material is removed as it is in boiling, the natural elasticity of the fibre is allowed to have full play.

The removal of this material also uncovers the natural gloss of the wool fibre, and after the boiling has taken place this lustre and gloss show up in considerable strength and beauty. Not only has the gelatine of the wool been

disintegrated, but the other foreign materials such as the grease and dirt that are present in the wool have been loosened and partially dissolved; this breaking up of these fatty and oily materials is a long step in the direction of the cleansing of the wool, and this cleansing is really the main feature which is sought after in any boiling operation.

On account of these various changes which have taken place in the structure and condition of the wool fibre after it has been boiled in water, it will be necessary to have an eye open to the demands of the dyeing operations. As a boiled wool will absorb more water and do it more quickly than the unboiled wool, because of the absence of the grease and fat, which serve to expel the water, it is in like manner true that the same action will take place in the absorption of dyes and mordants and any other liquids that are brought into contact with the wool in any stage of operation. Since this is true, wool that is expected to depend very largely for its value and beauty on its coloring, must be treated with boiling water in order that the color may produce its highest and best effects. Wools that are to be white vat dyed will show up better, therefore, if they are first boiled in clean water rather than treated with alkalies.

It may have been observed by those who are engaged in manufacturing woolen goods, that wools dyed dark shades are more easily cleaned than wools that are white or vat dyed. This is naturally the opposite of what would be expected, but, while we are well aware that a wool to be colored dark ought to be just as thoroughly prepared for dyeing as one that is to be white or some light shade, the preparation of a dark colored wool for dyeing is very apt in practice to be more or less slighted. But the strange thing about it is that the wool that has been most carefully prepared for coloring is after all the hardest to cleanse after dyeing has taken place, and the wool which was less carefully scoured before coloring can be cleansed more easily. The difference in chemicals and in dyestuffs in the two operations will not explain this fact, since there is no difference that is sufficient in this respect to alter the character and condition of the fibres. There is only one way to explain it, and that is, that the effect of boiling in water has been the cause. The greater care and perhaps longer time in boiling which the white or light shaded wool has undergone, has largely altered the structural condition of the wool fibre, and hence, when the second washing takes place after the dyeing has been done, the washing must get farther into the fibre itself than it would have to in the other case.

The boiling of woven cloths in the various processes of finishing, such as crabbing and steaming and in the old boiling operation which is still practised, has much the same effect as in the case of the fibre boiling above described. The one aim of the boiling of the cloth is to increase lustre, elasticity and beauty.

MANUFACTURER.

Carbonizing Wool.

We will divide this subject into two parts; first the study of the chemical action of the carbonizing acids on the animal and vegetable fibres, and then the study of carbonizing process itself.

1. Action of the destructive products on the vegetable and animal fibres. The vegetable impurities found mixed with raw wool, are formed for the most part of cellulose, similar to the cellulose of plants and trees. During the immersion in the acid liquor or gas these impurities absorb the acid, which does not, however, act upon the vegetable substance immediately, but if then the stock is subjected to the action of heat, the water is evaporated and then the acid acts upon the vegetable matter, converting it into a substance, which differs widely from its first condition in both its chemical and physical structure; this is hydro-

cellulose and is so brittle as to be easily converted into dust by pounding or pressure.

The wool fibre does not undergo this change, and this difference in the properties of the vegetable (cellulosique) fibres and the animal (kiratique) fibres renders possible the so-called carbonizing of wool; there are, however, few acids or salts which will produce this effect.

The wool owes to its peculiar structure, which approaches that of horn or bone, the fact that it is not materially changed in character, by the action of diluted acids; but it will not do to exaggerate this power of resistance to acids; the general appearance of the wool fibre is changed; the scales open and if the acid is too strong, say above 5 per cent. Baume, the fibre becomes harsh and partially disintegrated.

Nevertheless, if the process be carried on in a careful manner, and the acid be not too strong, the wool is not only not injured but the projections of the scales on surface of fibre is increased which improves the fulling qualities.

Experience teaches that it is very difficult not to alter the wool fibre by this chemical action, especially at the critical moment when the stock has become dry in the oven and the acid acts powerfully on the fibre; this action is indicated by the odor thrown out from the drying and baking ovens. According to very good authority, the same difficulties met with in the use of acid solutions, and due to their action on the wool fibre are also found in using the salts; the action of chloride of aluminum on the wool being similar to that of sulphuric acid.

2. Carbonizing. Although the process of carbonizing is identical for all the different materials, it will be well to take up each one separately that we may study the method adopted and material treated. We will, therefore, divide the carbonizing itself into three parts.

1st. Carbonizing of raw wool.

2d. Carbonizing of cloth.

3d. Carbonizing of rags.

As each one of these divisions forms a distinct industry, we will consider each one separately.

No. 1. Carbonizing of raw wool. After the wool has been scoured, it frequently happens that it can not be put along to the succeeding operations of manufacture, because of its being mixed with so much vegetable matter, such as burs, slivers, leaves, etc.

These vegetable impurities injure the spinning qualities of the stock, and at times make the spinning impossible, for if a bur, shive, or other foreign substance is found in the roping, that substance either causes the thread to break or what is still more objectionable, causes the thread to be bunchy or uneven. The wool is sometimes run through the so-called bur picker, which throws the hard burs to one side and delivers the stock free from all hard substances; but these machines clear the wool of foreign substances only partially; it happens frequently that, in place of removing the burs, the machine breaks them up and then the particles scattered through the stock are still more difficult to remove. When the wool has but few burs or seeds, they can be best removed by carbonizing in the piece.

The combing of wool for worsted yarn removes the greater part of vegetable matter which passes off with the noils. The specks can be removed, when there are but few of them, by hand specking the manufactured goods, an operation which necessitates another, that of sewing up the holes where specks have been removed.

Sometimes the specks are covered by a dye bath, a process called bur or speck dyeing. But if the raw wool is charged with any considerable quantity of vegetable matter, it can be purified by chemical means only. This mode of treatment, as we have already stated, rests upon the prop-

erty possessed by all vegetable matter of having their physical and chemical structure so altered by the combined action of some acids and a certain degree of heat, that it becomes brittle and easy turned to dust by pressure or pounding. By this method the wool will be but slightly affected, providing the acid bath is carefully regulated during the process, and the acid is removed from the stock by washing or neutralizing after the carbonizing process is finished; but whatever process of carbonizing is followed, the wool fibre will be rendered less elastic and lose in same degree its natural fulling qualities.

Method of procedure. The scoured wool is immersed in the acid bath varying from 1° to 4° Baume, according to the nature of the wool and the impurities which it contains, for not over twelve hours.

Some carbonizers prefer to use a bath of from 5° to 7° Baume, and leave the stock immersed or two hours.

The acid bath is contained in either cisterns of masonry or in lead lined tubs. During the immersion, the stock is frequently stirred. After this operation is completed, the stock is taken to the hydro extractor, where the excess of acid is removed. It is then taken to the dry room, where it is dried thoroughly at a temperature of 30° to 45° C. The temperature is then raised to 75° C. or more, which effects the carbonizing desired. If the wool in a wet state is subjected at once to the action of the higher temperature, the fibre will be injured. By drying at a moderate temperature previous to the carbonizing, the acid becomes concentrated. The concentrated acid does not act so strongly on the wool at a moderate heat, as the diluted acid does at the higher temperature. The same effect is obtained by the use of either chlorohydric or sulphuric acid, and it will be found preferable to use a mixture of the two.—L'Industrie Textile.

Crepon Effects on Wool and Cotton Fabrics Obtained by Mercerization.

We notice in the last issue of the L'Industrie Textile, an article on crepon effects in half wool goods, produced by mercerization. Two samples are shown; No. 1, two color brown and black effect; No. 2, a solid maroon.

The crepon effect is secured by treating the half-wool fabric with caustic soda. They employ for this purpose a caustic bath, standing at from 15 to 30 deg. Beaume, and cooled down to from 5 to 10 deg. C., by meant of an appropriate cooling apparatus. After the fabric has passed through the usual preparatory processes, and been thoroughly dried, it is passed through the above named caustic bath in a dye-tub, furnished with carrying and squeezing rollers. The duration of the passage varies from one to three minutes, according to the size of the dye-tub employed, and the greater or less strength of the bath. After the mercerization, the cloth is passed immediately, without rinsing, into a cold concentrated acid bath, either chlorohydric or sulphuric. Here it is thoroughly manipulated, and then rinsed several times in water, and after that neutralized with ammonia. The acid bath should still remain strongly acid, after the passage of the pieces.

The mercerization is generally done before coloring, but there are among the diamine colors, which are well adapted for the coloring of this class of goods, a certain number of products which withstand without injury a treatment with caustic soda, the mercerization can, in these cases, be done after the coloring; or there may be particular reasons which would give the preference to that manner of proceeding; as, for example, for the blacks and the classical shades, which are made in large quantities.

The Lyonnaise Manufactory of Dyestuffs have issued a sample card showing a number of successful applications of this process, comprising

along with several very attractive two-color effects, a solid maroon, a green, and two blacks, mercerized after dyeing. It also contains a list of colors, which withstand mercerizing after coloring. The dyeing process on the fabrics, previously mercerized is done in the ordinary manner, in a neutral bath, but the sulphate of soda generally employed is partially reduced, ten grams per litre being sufficient. It is necessary to boil a little longer, as the cotton has a greater affinity for the dyestuff than the wool. When two-color effects are wanted, the wool is colored first; bisulphate of soda is added to the bath, in an amount equal to about ten per cent. of the weight of the goods. Then the cotton is treated as quickly as possible in a new bath heated to 30 deg. C., and with 20 grams of sulphate of soda and one-half gram of carbonate of soda per litre added.

For the fabric with the ground-work of black cotton, on the contrary, the cotton is colored first, at 40 deg. C., with the addition of 20 grams of sulphate of soda, and one gram of carbonate of soda, per litre. A diazotic bath such as the Diamine Black B H, for example, is used. Then the goods are rinsed and developed in Diamine. The wool is then treated in an acid bath.

For the goods which are to be mercerized after coloring, the dyeing is done in the usual manner, with the addition of 20 grams sulphate of soda per litre to the bath. Then the goods are rinsed, dried and mercerized.

MEMORANDUM OF THE SAMPLES.

No. 1—Two-Color.

Naphtylamine Black S. 4 lbs. per 100 for wool.

Orange Diamine D. M. 2½ lbs. per 100 for cotton.

Diamine Black B H. 3/10 lb. per 100 for cotton.

No. 2—Solid Color.

Bordeaux Diamine S. 3 lbs. per 100.

Diamine Brown M. ½ lb. per 100.

Naphtol Black 12 B. 1/10 lb. per 100.

Half-Wool Black S. 6/10 lb. per 100.

Tapestry Weaving.

Tapestry weaving was an art well known in the Eastern countries in the earliest times. Homer speaks of it. In the oldest Hebrew records we read the descriptions of the elaborate and costly hangings "wrought in gold and silver, and in divers colors." Centuries ago, in Eastern countries, the walls of the temples and palaces and the houses of the rich were lined with silk and cloth hangings, which bore beautiful designs, and were often ornamented with diamonds and other precious stones.

The history of the manufacture of tapestries can be traced all through the ancient and medieval periods. From Greece the industry was introduced into Rome and from Rome to France. Christianity and the tapestry art were introduced into France about the same time. In the records of the fifth century we find much mention of the industry in France. It was in the churches that the art was mostly displayed. In palaces, also, the walls were decorated with costly and elaborate tapestries.

One of the most interesting and historically valuable pieces of tapestry work now known to be in existence was that made at Bayeux in France. It was made under the direction of Queen Matilda and was made by herself and the ladies of her court. It was to represent the conquest of England by the Normans. The design of this most elaborate piece of work is to represent in various pictures the conquest. This piece of work is in seventy-two divisions, is twenty-two inches in height, and two hundred and fourteen feet long. Each of the divisions contains pictures of the scenes illustrative of the conquest of William the Conqueror. These pictures are singularly valuable as correct representations of the costumes and manners of the time of the conquest. This tapestry is now the property of the town of Bayeux.

SILK DEPARTMENT.

Silk Industry of the United States.

(Continued from June.)

The greatest silk craze that the country ever had was started in 1831 by a manual of silk culture prepared for the Massachusetts Legislature by Jonathan A. Cobb. Companies were formed all over the country to raise and manufacture silk. Mulberry trees were planted in every region and there was hardly a household in which some silk worms were not hatched and fed. The price of mulberry slips rose and rose until it is recorded that at an auction sale of rooted slips twelve inches or more long, held at Germantown, Pa., on Sept. 18, 1839, 260,000 slips were sold for $81,218.75 and a lot of 22,000 mulberry switches from six to eight feet long was calculated to be worth $45,000, or at the rate of 2½ cents for each bud on them. The bubble burst at the end of 1839 and in 1844 a blight which fell upon the mulberry trees ended the craze entirely, but at this day mulberry trees may be found in every part of the older States, remnants of that time. Efforts have been made to revive the industry since, especially in California and Kansas, and in 1882 a silk dress made from the product of fourteen States was presented to President Garfield's widow by the Woman's Silk Culture Association of the United States, but the work has again fallen into desuetude.

The form in which the raw silk reaches this country is in hanks or twists of the filament as it has been reeled from the cocoons. Each thread of these skeins is composed of five of the original filaments, cemented into one by the hardening of the gummy envelope of the filaments after these leave the basins of warm water in which the cocoons are put to be unwound. The preparation of this silk for the loom is called throwing, and this consists of about a dozen distinct operations. The first of these is putting the twist of raw silk on a reel and winding it off upon spools, turn by turn. Then comes the combining and twisting of the filament into threads of various kinds, known as "singles," "tram" and "organzine." An idea of the intricacy and labor involved in just this part of the operation may be gathered from the fact that a thread of ordinary sewing silk contains about two hundred filaments of the silk as the worm spun it. Every part of these operations must either be done by hand or watched continuously, for the silk thread is built up entirely of continuous filaments.

Although the silk throwing, spinning and weaving mills form the foundation of the industry in this country and their products for the year will probably amount to $100,000,000 or more, this is by no means the whole of the benefit which the country derives from them nor the extent to which they give occupation to workmen or capital. Around this central industry cluster those of the dyer, printer and finisher, the makers of machinery, the dealers in raw silk and in the manufactured goods and many cognate businesses. How much these all represent in capital and hands employed it would be difficult to estimate but in the various direct industries of producing ribbons, broad goods, sewing silks and twist, tie silks, hat bands, knit goods and laces, fringes, braids and trimmings, something like $120,000,000 is now invested and close to one hundred thousand hands are employed. Roughly speaking, about 50 per cent. in value of the silk product is in broad goods. 25 per cent. in ribbons and perhaps 10 per cent. in sewing machine silks and twists, leaving 15 per cent. for the varied products of the other factories.

Many attempts have been made to supersede the product of the silk

worm for textile use, but as yet none has succeeded although artificial silks of several kinds have recently obtained a fair hold as a commercial product. The first attempt in this direction was in cultivating spiders as a rival to the silk worm. Queen Cleopatra is said to have had a robe of spider's silk that could be drawn through a finger ring, but she was not noted for wearing much clothing. M. Cachot, a Frenchman, has recently succeeded in getting a considerable product of spider silk, by petting the spiders and reeling off their thread slowly, but there is no prospect that his system will become of any importance. The artificial silks are made of wood fibre, reduced to cellulose by the action of acids. This is dissolved to a glue-like consistency, forced through holes in glass and drawn out into threads which dry and harden in the air just as those of the silk worm or spider do. In fact, the material of this thread is identical with that produced by the spider and silk worm, and the fabric produced from it has the same qualities except that it is more harsh and does not wear so well. A cheaper substitute for silk is made of glue or gelatine drawn into threads in a similar manner, but this could never rank as anything but an imitation of silk.

Another imitation of silk is mercerized cotton, which is now finding its way into many uses. The process of giving to cotton a lustre like silk and also adding much to its strength and wearing qualities, was discovered by Joseph Mercer, an English weaver. The cotton is treated, either in the yarn or piece, with caustic soda, and stretched if a lustre is wanted, and the effect of the treatment is to change the fibre into a silk-like substance. Mercerized cotton, however, will never replace silk, although there is, without doubt, a large field for its use.

The Flight of the Shuttle.

The difficulties met with, and the problems arising for solution in weaving the textile fabrics vary according to the texture of the goods and the material used. Woolen, cotton, linen, and silk weaving, each have conditions peculiar to themselves, and nowhere is this fact better illustrated than in the propulsion of the shuttle across the warp.

In woolen weaving, owing to the extra heavy weight and size of the shuttle, extra care must be taken that the different shuttles in a "set" vary as little as possible in weight; this necessity is still further enhanced by the great distance to be traversed at each pick. Driving a woolen shuttle weighing 16 ounces across a warp made of strong, coarse, hairy yarn and into the opposite shuttle box, 100 inches from the box, from which shuttle starts, and repeating this operation 92 times per minute presents conditions and problems very different from those involved in the comparatively narrow cotton or silk looms, using cotton or silk warp and filling, each of which vary so widely in character from the woolen thread.

Theoretically each shuttle should take a straight course from its first position to the opposite box. Practically it does nothing of the kind, as the unavoidable variation in the shuttles, the picking shoes, the different shuttle boxes, binders or springs, the pickers and the speed of the loom, all will affect the conditions under which the shuttle receives the blow from the picker, and consequently the exact direction of its flight.

When such uncontrollable events as the throwing on or off of heavy machinery throughout the mill, even with the best speed regulator known, will affect the mill engine and consequently the speed of the loom, it is idle to hope for perfection in the movement of the shuttle.

The construction of both loom and shuttle allows for this variation; the shuttle being pointed can vary slightly in line of flight and still not miss the box, which, being necessarily the size of largest part of shuttle

which it must receive, allows the pointed end of shuttle to vary considerable and yet reach "home."

Again the warp yarn or shed serves to guide the shuttle on its way and remedy any slight variation in the direction taken by it on the start.

But there are other difficulties encountered when this initial direction varies too much. One of these is peculiar to silk weaving and develops frequently to the great annoyance of the fixer and damage to the goods. Silk yarn is so fine and the individual thread is so delicate and frail that only the slightest blow is necessary to cut or damage it. This can easily be demonstrated by placing a dozen or more threads on a metal surface and striking them a light blow with a piece of wood. One would be surprised to find how light a tap is required to so injure the threads as to cause them to break when under such strain as they are subjected to when being woven on the loom.

Now suppose a shuttle is deflected slightly from a straight course as it starts from the box; it will soon come against either the reed or the warp yarn and be deflected downward; when it strikes the threads lying close to the hard metal race plate, and under considerable tension, we have the conditions required for breaking the threads. Sometimes a dozen threads will break at one place, and the fixer is often puzzled to find the proper remedy. He may be in ignorance as to the true cause, and in case he is not, it is frequently no easy matter to apply the remedy as the cause may be due to so many different things, such as variation in speed of loom, too sudden or sharp a blow on the shuttle; picker being worn so that the shuttle point does not "centre" properly; shuttle binders being worn; too much or too little power on the picker stick, and in fact many things which may cause the deflection of the shuttle. This is a difficulty peculiar to silk weaving and serves well to illustrate the inherent difference between cotton or woolen and silk weaving, due to the structural difference in the thread.

Ribbon Trade.

The ribbon industry has been depressed recently, owing to the fact that fashion has turned away from ribbons. The depressed condition of the business, and consequent overproduction caused a pronounced yielding in prices. Mr. Rometsch stated before the annual meeting of the Silk Association of America, that the cutting of prices under these conditions (so often prevalent) only tends to further weaken the market; and the attempts to cheapen goods in order to meet the reduced prices and still have a margin of profit are bound to play havoc in the end.

The same conditions do not exist in Europe. The manufacturers there, as a rule, are more independent in their relations to the buyer, and simply will not sell unless at a profit. Exceptions of course, may occur once in a while; but, as a rule, the production is restricted and the goods are not sacrificed. We think it would be to our advantage to learn from our European cousins in this respect.

—The Verviers Chamber of Commerce is giving serious attention to possible palliatives and checks to the gambling in futures, and may put itself into relation with the leaders of the French anti-wool futures movement.

—A new Factory Law has been promulgated in France. It provides that women and persons under 18 years of age shall not be employed more than eleven hours a day, which after two years is to be reduced to ten and a half hours, and after another two years to ten hours.

—The use of fans for the mechanical production of draft in industrial steam boiler practice, although not quite a recent innovation, is one which merits considerably more attention than it has hitherto received.

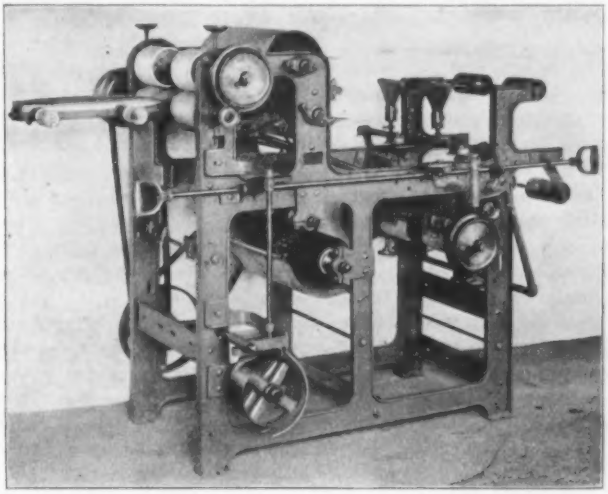
Singeing Machine for Elastic Fabrics.

The illustration shows the singeing machine for elastic fabrics built by Charles H. Knapp, Wait and Rye Streets, Paterson, N. J. It is adapted for all kinds of elastic fabrics. It singes both sides of the web at the same operation, taking two pieces five inches wide or four of narrower width.

The webs can be run through slack or stretched to desired tension, as required, as the take-up and delivery rolls are driven and connected in such a way that the stretch in the web can be regulated while running, and yet there is positive delivery, with no danger of the webs burning off. Revolving brushes clean the webs before and after singeing.

The burners are connected with the belt shipping handle in such a way that they cannot be under the web unless the machine is running and the web is in motion. Moreover, the machine cannot be stopped, or, that is, the belt cannot be moved to the loose pulley, until the burners are moved from under the web. This does away with any possibility of burning the web while the machine is being put in motion or stopped. The burners are so arranged as to burn a blue flame, and there is no air compressor or blower needed. The singeing can be regulated to a nicety and the machine does its work well and turns off a large production.

Mr. Knapp has given special attention to designing and building singeing machines, and makes them for all classes and widths of goods, including cotton, silk, worsted and mohair yarns, narrow fabrics and all kinds of piece goods up to 72 inches wide, and would be pleased to hear from manufacturers regarding their requirements in this direction for any regular or special work they may have in view.



KNAPP'S SINGEING MACHINE FOR ELASTIC FABRICS.

—Two years ago the New Zealand government biologist obtained a few roots of the rhea plant. These were carefully propagated at the government experimental station at Momohaki, North Island, with the result that this season there are about ten thousand roots available for distribution.

—The extra weft in cotton cloth is often clipped off at the back, where it is not used for figuring, and the clear ground cloth is obtained.

POWER DEPARTMENT.

ELECTRICITY—STEAM—WATER.

Erratic Engineering.

Notwithstanding the terse, trite and timely admonition of Davy Crockett, to "be sure you are right and then go ahead" many important undertakings are commenced without due consideration or certainty of right, and often without any very definite ideas of the requirements essential to the economical or successful completion of the projects.

With an ill chosen and not easily accessible site, poorly designed buildings, inferior machinery and perchance deficient, or not economical, power appliances, it is not very surprising that with the sharp competition of recent years, that the balance in the profit and loss account is too often found on the wrong side of the ledger. Yet such is often the experience of those who from lack of experience have proceeded without knowledge of things with which they have attempted to deal, and lack of success is quite often attributed to other than the real cause.

In planning a manufacturing plant it is important to have the machinery arranged so that successive operations or processes may, as far as practicable, come in regular order without unnecessary carrying of stock any considerable distance from one locality to another, or to materially hinder complete supervision by the superintendent or overseers in charge. Advantages in this line have been well demonstrated by the re-organization of plants, even to the tearing down and re-building of some of the once considered first-class establishments, in fact many mills built on a cheap scale and with indefinite plan have been profitably remodeled or rebuilt, on account of originally unintelligent and unprofitable construction.

In the selection of machinery, adaptation and efficiency for its purpose is of course of prime importance, while simplicity of design, thoroughness of construction, accessibility of parts, are each essential elements for consideration and in an economic point generally more important than price, as the attempt to save a few dollars in the cost of construction often involves many times as much in cost of repairs and inefficient work of machine.

In the line of motive power, if steam is the motor, the matter of safety is of first importance and next to that economy of operation, and first-class appliances in boilers and engines are generally more important and profitable in the long run than the cheaper kinds that consume more than their worth in extra fuel every few months of their use.

The same is true of appliances for the utilization of water power when that is used as a motive power, especially if used in connection with or supplemented by steam power, or where its value becomes equal to the cost of steam power.

In the utilization of water power, the character of the water shed should be considered, in relation to the judicious establishment of reservoirs, and proper surveys with a little mathematical calculation in this, is an advantageous adjunct to a modicum of good judgment essential to the proper control of a stream for maintaining the most serviceable supply of water for power purposes.

Then after selection of the most available sites for reservoirs and the construction of dams and canals, etc., in the most economical and permanent manner comes the installation of water wheels and machinery of transmission of which that best suited to conditions of the case should be selected. Of water wheels the better

grades of turbines are unquestionably superior and more desirable than the old style "bucket" wheels, once, and perhaps still, held by many in high estimation for their well known good qualities.

Of turbines however there is probably less general knowledge of their real merits than of almost any other machine of such general use, and nearly all of the modern and popular varieties are claimed to have the "highest efficiency," generally 80 per cent. or more. Yet, there is in this most essential element of a power plant occasion to exercise unusual caution in selection, as the claims of high efficiency, though certified by the seemingly good authority of so called tests, do not in all cases show proof of their excellence in their practical results.

Although this is a somewhat difficult matter to ascertain in many cases, and this inability to determine coupled with the somewhat reduced cost and the fact that almost any wheel may be called "good with plenty of water," has permitted the popularization of a class of seriously wasteful and unprofitable turbines; but with the more general use of electrical machinery by which the power capacity of wheels is sometimes revealed, their deficiencies in that line are becoming more apparent and when investigation is extended to water measurements their lack of efficiency is more fully shown, and instead of 80 to 90 per cent. advertised efficiency the actual results are sometimes found below 60 per cent.

In the machinery for the transmission of motion and power to the various points of use, there is occasion for the exercise of some discretion as well as knowledge of principles and of the strength of materials. The size of shafting for transmitting power at any given velocity is easily determined by definite and well established rules.

The speed is generally to be determined by the convenience and necessities of the case having due regard to economy in first cost and future maintenance and operation with due conservation of power. And this to a large extent governs the proportions of gears, pulleys and belts. In these it is well to note that unduly small driven gears as pulleys consume much more power by increase of pressure on their shafts than would be the case with larger ones, and small pinions and small pulleys with tightly strained belts are in all cases to be avoided as far as practicable.

Gears of insufficient proportions wear out rapidly, and beside entailing much needless cost for their frequent reproduction, generally involve considerable loss of power by their less perfect action as their teeth become worn out of proper form, hence gears more than ample for their work are more economical than insufficient ones.

In determining the size of pulleys to be used in a mill as they are generally bought before the cost of belting is considered, the tendency is to save cost as far as may be regarded as practicable by limitation of size. This often results not only in more shaft friction by greater tension of tight and heavier belting—but in considerable extra cost of belting beyond what would have been necessary with pulleys of larger diameter and frequently much greater than any saving in first cost of pulleys as well as continued increase in expense of maintenance.

To illustrate this let us suppose that the distance between two shafts is 20 feet and that they may be connected by a belt 12 inches wide on pulleys 15 inches in diameter which will suffice to carry the load. This will require about 44 feet of 12-inch belt worth perhaps $1.00 per foot or $44.00, and two pulleys 15 by 12 inches worth about $4.00 each or $52.00 for both pulleys and belt.

Now, if pulleys were twice the size or 30-inch diameter the speed and transmitting power of belt will be doubled, so that a 6-inch belt at half the cost of the 12-inch one, and two

pulleys 30 by 6 inches at about $6.00 each, making $34.00 for the pair of pulleys and belt, makes a clear saving of $18.00, or more than one-third of the first cost and about one-half in every renewal of the belt, beside decreasing the side strain on shafts by fully 50 per cent. which is a gain by saving in cost, service and maintenance worth considering.

There are many other points in mill engineering worthy of attention, but space is not sufficient to pursue them further at this time.

J. HUMPHREY.

Calculating Size and Speed of Pulleys and Gears.

Few calculations are more frequently employed in every day mill work than those for determining the size and speed of pulleys and gears. Most mill men are doubtless familiar with the rules for such calculations, but as we frequently get inquiries in regard to them, we have thought it desirable to publish the rules here. The same rules apply to both pulleys and gears, whether connecting two shafts together or connecting a shaft with a machine.

There are four factors in these calculations; namely, the speed and size of each pulley or gear. We will illustrate the rule by the accompanying illustration, Fig. 1, of two pulleys connected by a belt.

The size of a pulley, multiplied by its speed, is always equal to the size of the connecting pulley, multiplied by its speed. For the size we may take either the diameter, circumference or radius of the pulley or gear, or the number of teeth in the gear. Generally the diameter of pulleys and the number of teeth in gears is taken.

For speed we take the number of revolutions in any given time; minute, hour, day or week. The minute is usually the most convenient.

Suppose pulley A to be 24 inches in diameter, running at a speed of 250 revolutions per minute, and pulley B to be 8 inches in diameter, running 750 revolutions per minute, then $24 \times 250 = 6000$ pulley A; $8 \times 750 = 6000$ pulley B.

The problems arising in mill work are to find one of these four factors, when three of them are known.

The general rule may be stated as follows: The size of one pulley can be found by multiplying the size and speed of the other and dividing this product by the speed of the first one.

The speed of the first one can be found by multiplying the size and speed of the other pulley, as above, and dividing this product by the size

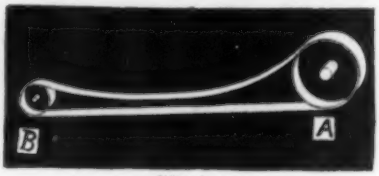


FIG. 1.

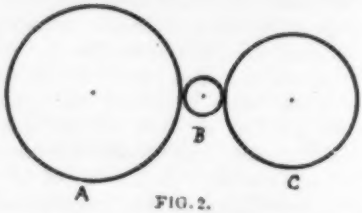


FIG. 2.

of the first one. For example:

Suppose the shaft A to be running 150 revolutions per minute and that pulley B is 6 inches in diameter and it is desired to run pulley B 450 revolutions per minute, what must the size of the pulley on shaft A be? $450 \times 6 = 2700$; $2700 \div 150 = 18$, size of pulley required.

Suppose we have a pulley 15 inches in diameter on shaft A, which is running 240 revolutions per minute, and we want to know how fast this pulley will drive another one, which is 6 inches in diameter on shaft B. $240 \times 15 = 3600$; $3600 \div 6 = 600$, speed of second pulley.

Fig. 2 represents a chain of gears, in which gear A is driving gear B, which connects with a third gear C.

Suppose A has 120 teeth and run-

ning at a speed of 40 revolutions per minute, and that B has 20 teeth and C 100 teeth, what will be the speed of B, and of C? Speed of A 40 × number of teeth 120 = 4800. 4800 ÷ teeth in B, 20, = 240, speed of B. Speed of B, 240, × teeth in B, 20, = 4800. 4800 ÷ teeth in C, 100, = 48, speed of C.

Changing the size of gear B will not affect the speed of gear C, as the product of the speed and diameter of C must be 4800, the same as the product of speed and diameter of A.

The speed and size of worm gears are calculated in the same way as are ordinary gears; the worm gear, if single, is figured as a gear with one tooth; or if a double worm, as a gear with two teeth.

Forced Combustion.

Mills and Rowan, in their exhaustive work on Chemical Technology, make the following pertinent statements regarding the subject of mechanical draft: "The principles of what is now becoming well known under the name of 'forced combustion,' have been repeatedly advocated during past years by those who have devoted thought and study to the subject. The position assumed by them—which is now finding favor amongst engineers—has been, in brief, that the air supply required for combustion in furnaces can be more economically furnished by mechanical power than by the action of chimneys; and that the mechanical method has other advantages, which enable it to be preferred to the one which is older, but more imperfect. One of these advantages is the higher temperature of combustion, which is equivalent, with a boiler of good design, to an increased evaporative power of the boiler, or to increased evaporative effect for the fuel. Another advantage, which has not been fully realized in any plan as yet introduced in practical work, is that the rate of travel and escape of flame and hot products of combustion is under control. It is thus possible to cool them more completely than can be done when chimney draft is used, and this means a saving of heat which would otherwise be uselessly dissipated. Mechanical or artificial draft thus presents to us a method of economically furnishing the air supply to furnaces and producing a more efficient combustion temperature, while it also renders possible further economies due to retarding the movement and escape of hot gases, and to preliminary heating of the air supply by waste heat or otherwise."

The Future Development of the Steam Engine: A Forecast.

Paper read before the Manchester, England, Association of Engineers, by Alfred Saxon.

(Continued from June.)

Our next point of progress, greater expansion, has now to be examined. The adoption of higher steam pressures allowed engineers to avail themselves of the expansive properties of steam, also to provide for the utilization of the greater range of working temperatures, and to reduce initial condensation in the cylinder by compounding or dividing and subdividing the total expansion. The compound type of engine was introduced about the year 1854, in a practical form, followed by the triple, in marine practice, about 1874, and later by the quadruple type. Each of these types became practical and economical under suitable conditions of boiler pressure. The idea of introducing additional cylinders to obtain greater expansion has not been adopted to any large extent in locomotive practice. To show how comparatively recent was the adoption of triple and quadruple expansion engines in land practice, I would refer you to the Jubilee Exhibition, held in Manchester in 1887, when examples of simple and compound engines only were shown by the leading makers.

Coming to our third point of progress—increase in speeds of piston and rotation. The advantages of high-speed steam engines have now been

well recognized, as they provide a means of obtaining considerable power at a small initial cost; they are capable of being combined direct with such machines as dynamos, centrifugal pumps and fans, thus avoiding the loss of power in the latter and economizing space, and can be easily worked in connection with a condensing plant, ensuring the greatest economy.

The Willans type single-acting constant thrust was for a time the only successful type of high-speed engine, but since the introduction of forced lubrication, the high-speed double-acting engine has proved to be a success in its noiseless working and increased efficiency.

The increase of piston speed during the century has been common to all types of engines—locomotive, marine and stationary. Locomotive is ahead of marine and stationary practice in speed of piston: from 750 feet per minute for ordinary practice, up to 1500 feet per minute for exceptional high-speed practice has been attained. Marine practice comes next, varying from low and moderate speeds of 425 to 600 feet per minute, to high speed and extreme practice in such craft as torpedo boats from 850 to 1200 feet per minute. In stationary-engine practice we find piston speeds to vary from 500 to 1000 feet per minute; this will cover the ground of slow-revolving engines of long stroke as well as quick-revolving engines of short stroke.

Incidentally I may remark that the Glasgow Corporation engines are intended to run at a speed of 75 revolutions per minute, with a stroke of 5 feet, thus giving a piston speed of 750 feet per minute.

In connection with the distinct lines of progress referred to, we find the gain in "duty" to be the best measure of progress; the greater amount of useful work performed by the unit of fuel consumed has been progressive, and has obviously increased with the rise of the steam pressure.

The gain in economy during the nineteenth century has been considerable, the consumption at the commencement being from 8 to 9 pounds of coal per indicated horse-power per hour, whereas at the present time, in the best type of engine, it has been reduced to 1½ pounds per indicated horse-power, and even lower in extreme cases.

The nineteenth century has a record of many improvements to which it is impossible to refer in the short time at my disposal; but I should like to state that the introduction of continuous lubrication to valves and pistons and the principal working parts of the engine has been of great service, and has contributed to increased efficiency.

And now, Mr. President, after this review I shall venture to enter into the forecast that my title demands.

In the first place it will be well to see what the probabilities of the new century are in reference to the direction of progress. We have noticed that marine practice has exercised the greatest influence on the progress in the nineteenth century, but in the new century the demands for electricity are likely to be the principal factor.

Today we are face to face with the problem of producing electricity for all purposes at a sufficiently cheap rate. In this country we are handicapped in our competition with other industrial countries by the fact that only to a limited degree can we use water power for the direct generation of electricity; it becomes, then, a matter of vital importance to this country that the steam engine and steam-producing plant intended for the generation of electricity in the future should be brought to the highest degree of perfection possible.

First, with regard to pressure, the steam pressures adopted will be as high as the materials and construction of the boilers will admit of; I have no doubt that with a revolution in boiler construction, which we may confidently expect, that standard pressures will rise up to 500 pounds, and probably even higher.

(To be continued.)

DYEING DEPARTMENT

Dye Recipes for July.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16 page pamphlet, in convenient form for preservation. Subscription price for the TEXTILE WORLD with the Dyers' Supplement is $4.

Recipe No. 97.

Dark Brown on Cotton Yarn.

Benzo Chrome Brown C R on 100 pounds of cotton yarn.

Prepare the dye bath with

4 lbs. Benzo Chrome Brown C R.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
15 lbs. Glauber's Salt.
1 lb. Soda.

Enter material at 180°, bring to boil with constant working, and dye at this temperature for one hour.

Benzo Chrome Brown may be after treated in a bath made up as follows for 100 pounds of material:

2 lbs. Copper Sulphate.
2 lbs. Potassium Bichromate.
½ lb. Acetic Acid.

When thus treated the shade is modified to a rich maroon brown which is extremely fast to washing, and possesses very good fastness to light.

Recipe No. 98.

Khaki Shade on Cotton Yarn.

Compound Shade on 100 pounds of cotton yarn.

Prepare dye bath with

2 lbs. Immedial Bronze A.
18 lbs. Diamine Fast Yellow B.
24 lbs. Diamine Orange B.
(Wm. J. Matheson & Co., Ltd., 182 Front St., New York.)

and

1½ oz. Soda.
1½ oz. Sulphide of Sodium.
4½-8 oz. Glauber's Salt.

per 10 gal. of water.

Enter at 170° F., bring to a boil, and dye at this temperature for one hour.

The material is then after treated with

1½ lbs. Copper Sulphate.
1 lb. Acetic Acid.

per 100 lbs. of goods.

The shades produced in this way possess excellent fastness to washing and light.

Recipe No. 99.

Scarlet on Worsted Carpet Yarn.

Wool Scarlet L V on 100 pounds of worsted carpet yarn.

Prepare the dye bath with

3 lbs. Wool Scarlet L V.
(J. Howell Jones, 18 Burling Slip, New York.)
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter yarn at 160° F., bring to a boil, and dye at this temperature for one hour, exhausting the bath if possible.

Wool Scarlet L V is well suited for carpet yarn and other work where very bright and clear shades are desired.

Recipe No. 100.

Blue on Cotton and Worsted Mixed Goods.

Union Blue No. 241 on 100 pounds of cotton and worsted mixed goods.

Prepare the dye bath with

4¼ lbs. Union Blue 241.
(Anchor Color Manufacturing Co., 462 Cherry St., New York.)
20 lbs. Common Salt.
20 lbs. Glauber's Salt.
1 lb. Sal Soda.

Enter goods at 170° F., run for one hour at this temperature, then raise to the boil and dye 1½ hours longer.

When dyed in this way Union Blue 241 gives an excellent Navy Blue on mixed goods or on mixed shoddy goods. Its fastness is very good and it is also cheap, and dyes in succeed-

ing baths with the use of ⅓ less dyestuff.

Recipe No. 101.

Yellow on Cotton Yarn.

Direct Yellow C R R on 100 pounds of cotton yarn.

Prepare the dye bath with

2 lbs. Direct Yellow C R R.
(Schoellkopf, Hartford & Hanna Co., 100 William St., New York.)

20 lbs. Common Salt.

Enter yarn at 180° F., bring to a boil and dye at this temperature for one hour.

Direct Yellow C R R has a high coloring power, and may be used to advantage with lower percentages than that mentioned above.

Recipe No. 102.

Blue on Worsted Yarn.

Wool Blue R Extra on 100 pounds of worsted yarn.

Prepare dye bath with

2 lbs. Wool Blue R Extra.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)

20 lbs. Glauber's Salt.

5 lbs. Sulphuric Acid.

Enter the material at 160° F., bring to a boil and dye at this temperature for one hour.

Wool Blue R Extra possesses level dyeing properties, and its fastness to alkalies and acids is excellent. It can also be advantageously applied in wool printing.

Recipe No. 103.

Dark Green on Cotton Yarn.

Direct Green B C on 100 pounds of cotton yarn.

Prepare the dye bath with

3 lbs. Direct Green B C.
(Schoellkopf, Hartford & Hanna Co., 100 William St., New York.)

20 lbs. Common Salt.

Enter yarn at 180° F., bring to a boil and dye at this temperature for one hour.

Direct Green B C produces a dark shade of green with considerable brilliancy, and dyes very level.

Recipe No. 104.

Violet on Cotton Yarn.

Direct Fuchsine on 100 pounds of cotton yarn.

Prepare the dye bath with

3 lbs. Direct Fuchsine.
(Bosson & Lane, 36 Central Wharf, Boston.)

20 lbs. Common Salt.

Enter the yarn at 180° F., bring to a boil and dye at this temperature for one hour.

Direct Fuchsine is somewhat of a novelty among direct colors, being bright for the character of the color and very fast.

Recipe No. 105.

Black on Cotton Yarn.

Columbia Black F F Extra on 100 pounds of cotton yarn.

Prepare the dye bath with

6 lbs. Columbia Black F F Extra.
(Berlin Aniline Works, 72 Front St., New York.)

25 lbs. Glauber's Salt.

1 lb. Soda.

Enter yarn at 180° F., bring to a boil and dye at this temperature for one hour.

Columbia Black F F Extra has a very high coloring power, and in every respect is an excellent direct cotton black.

Recipe No. 106.

Bluish Violet on Worsted Yarn.

Fast Sulphur Violet 5 B S on 100 pounds of worsted yarn.

Prepare dye bath with

2 lbs. Fast Sulphur Violet 5 B S.
(F. E. Atteaux & Co., 176 Purchase St., Boston.)

2 lbs. Sulphuric Acid.

Enter yarn at 170° F., bring slowly to a boil and dye at this temperature for one hour, exhausting the dye bath. For light shades it will take less time to exhaust.

To assure evenness, it is well to add the dyestuff in separate portions, rather than at one time.

Fast Sulphur Violet 5 B S is characterized by its fastness to alkalies, acids and washing. Its fastness to

light and rubbing is exceedingly good, and owing to its property of dyeing level, is particularly suitable for piece dyeing.

Recipe No. 107.

Red on Worsted Yarn.

Azo Red G on 100 pounds of worsted yarn.

Prepare the dye bath with

3 lbs. Azo Red G.
(C. Bischoff & Co., 87-89 Park Place, New York.)

4 lbs. Sulphuric Acid.

10 lbs. Sodium Sulphate.

Enter yarn at 160° F., bring slowly to a boil and dye at this temperature one hour, exhausting the bath if possible.

To insure evenness, it is well to add the acid in separate portions, rather than at once.

Azo Red G possesses very good fastness to light, washing, acid, rubbing, sulphurous acid, ironing, steaming and carbonizing.

Recipe No. 108.

Dark Blue on Worsted Yarn.

Phenocyanine T V on 100 pounds of worsted yarn.

Mordant the yarn by boiling for 1½ hours in a bath containing

3 lbs. Bichromate Potash.

2½ lbs. Tartar.

Wash and dye in a bath made up with

5 lbs. Phenocyanine T V.
(A. Klipstein & Co., 122 Pearl St., New York.)

1 lb. Acetic Acid.

Enter the yarn at 100° F., bring slowly to a boil and dye at this temperature for 1½ hours.

Phenocyanine T V when dyed in this way is very fast to light and fulling.

Recipe No. 109.

Pink on Worsted Yarn.

Fast Acid Phloxine A on 100 pounds of worsted yarn.

Prepare the dye bath with

1½ lbs. Fast Acid Phloxine A.
(Victor Koechl & Co., 122 Hudson St., New York.)

10 lbs. Glauber's Salt.

2 lbs. Sulphuric Acid.

Enter yarn at 160° F., bring slowly to a boil, and dye at this temperature ¾ to 1 hour, exhausting the bath.

Fast Acid Phloxine A produces a beautiful shade of bluish pink, and possesses good properties as to fastness.

Recipe No. 110.

Yellow on Worsted Yarn.

Anthrozine Acid Yellow C on 100 pounds of worsted yarn.

Mordant the yarn by boiling for 1½ hours in a bath containing

3 lbs. Bichromate Potash.

2½ lbs. Tartar.

Wash, and dye in a bath made up with

3 lbs. Anthrozine Acid Yellow C.
(A. Klipstein & Co., 122 Pearl St., New York.)

1 lb. Acetic Acid.

Enter the yarn at 100° F., bring slowly to a boil and dye at this temperature for 1½ hours.

Anthrozine Acid Yellow C, when dyed in this way, is very fast to light and fulling.

Recipe No. 111.

Blue on Cotton Yarn.

Phenedene Blue R R on 100 pounds of cotton yarn.

Prepare dye bath with

3 lbs. Phenedene Blue R R.
(Sykes & Street, 85 Water St., New York.)

40 lbs. Common Salt.

28 to 30 times weight of cotton of water.

Enter yarn at 140° F., bring to a boil and dye at this temperature for one hour.

Allow to cool in the bath for 20 minutes and wash and dry.

Phenedene Blue R R is very bright, dyes evenly, and combines well with other direct cotton colors.

Recipe No. 112.

Red on Bleached Cotton Yarn.

Direct Safranine B on 100 pounds of bleached cotton yarn.

Prepare the dye bath with
1 lb. Direct Safranine B.

(John J. Keller & Co., 104-106 Murray St., New York.)

20 lbs. Common Salt.

Enter at 180° F., and dye at this temperature for one hour.

Direct Safranine B produces a brilliant and even shade of bluish red.

Dyeing Cotton.

The preliminary treatment of cotton before dyeing is all important, and hence requires every care and attention. The duration of the scouring required depends both on the quantity and on the quality of the cotton. For example, fine yarns, especially Makko yarn, require longer time than ordinary yarns, as they contain more fat and gum than the latter, as is indicated by their naturally yellower color. Much time and fuel is saved by entrusting the work to a special hand, thoroughly experienced in the process. If the yarns are scoured too long they are damaged, and lose their shape. On the other hand, insufficiently scoured cotton dyes badly, especially in the cold. Very fine stuff should be boiled in sacks to prevent it from becoming felted, as it is very liable to be in an open pan.

When the yarn has been properly scoured clean vats are filled with it, and it is rinsed with cold water till that which runs off is perfectly clear. If the subsequent dyeing is to be with substantive coloring matters it is advantageous to use the wash water warm, and to add a little soda crystals to it if it happens to be hard. This assists in the securing of uniformity. On the other hand, cotton to be dyed with adjective dyes must never be rinsed in alkaline solutions. The greatest danger in scouring is the production of the well-known blotches, which if not removed will show through the darkest dye. They are best got rid of with sulphuric acid, which must be thoroughly rinsed away afterwards. It is better, however, to prevent them by adding the acid to the scouring water in the proportion of about a gallon of the strong acid for every 500 pounds of yarn. This need only be done for the first boil. This method should always be adopted before dyeing with basic dyes, which tend to go on too fast, and will be found of the greatest assistance in obtaining level shades. To save scouring, a product called okotan has been on the market for some years. It does not, however, seem to do much good, and especially with basic and natural dyes appears to make them smudge, by choking up the pores. Besides, the substance is by no means cheap, and cannot be used with unsoftened water. With substantive dyeing it answers fairly well.

For the actual dyeing, a wide knowledge of the different sorts of dyes is indispensable, if as much time and cost as possible are to be saved, and the best possible result obtained in respect to good appearance, fastness, and other desirable properties. Special attention is needed to the effect of ironing upon the color. With dyes that darken on ironing, it is necessary, in dyeing to pattern, to dye somewhat lighter than the pattern, as they take long to return to their original hue.—W. Lindner in the Leipziger Farber Zeitung.

Fixation of Indigo on Fabrics by Means of Zinc Powder and Acetone Bisulphite.

The products obtained by the reaction of alkaline bisulphites on the Aldehydes and Cetones, have provided a means of producing well-known reactions on the fibre, but have remained practically unused in printing. The reaction is as follows:

$$\begin{matrix} R \\ CO \\ R' \end{matrix} + MHSO^3 = C\begin{matrix} R \\ OH \\ SO^3M \\ R' \end{matrix}$$

The mixture of Powder of Zinc and $MHSO^3$ forms a very strong reducing agent, capable of reducing the in-

digo nearly instantaneously. The following is my method of procedure:

Artificial Indigo of the Badische Aniline and Soda Fabrik, per 100	20
Zinc Powder	8 to 12
Bisulphite of Acetone	40
Thickening	32 to 28
Total	100

After the printing, I steam the goods for one to two minutes, until a complete reduction is effected. Then, let it oxidize in air or running water, and then wash. A solution of boiling caustic soda, composed of five parts of soda per litre would brighten the shade. A small quantity (say four per hundred) of aluminate of soda to make the color slightly alkaline, would hasten the reduction. Small quantities of glue or gelatine deepens the shade. This new process can be used without inconvenience in the coloring with Aniline Black, orange, chrome, etc.—M. Arthur Pelizza in Bulletin of the Industrial Society of Muhlhouse.

The Phenedine Group of Direct Dyeing Colors.

Under the above name (Phenedine) an entirely new series of direct dyeing colors has been brought out, which combine many new and valuable features, commending themselves to cotton dyers generally.

These dyestuffs are distinguished by their even dyeing properties at boil, and by the fact that they produce shades of considerable fastness to the usual influences to which cotton dyed with direct colors are generally subjected.

The exhaustion of the dyebaths of these colors is quite uniform, a feature which will certainly meet with the approval of all dyers, as it enables them, in a majority of cases, to use continuous kettles without danger of variation in the shades produced by later dyeings.

For dyeing mercerized yarns the phenedines are particularly valuable, because of the regularity with which they are taken up by the fibres, thereby preventing, or avoiding, the streakiness frequently noticed with many of the so-called "direct dyeing colors," this streakiness being due principally to the great affinity that mercerized cotton possesses for coloring matters.

The Phenedine Blues comprise a very extensive range of shades, the majority of the products being of such a nature as to permit of being treated in a subsequent bath of Bluestone, which, with a slight modification of shade, materially increases its fastness to light, fulling, etc., a property which will be readily appreciated by all practical dyers. This process of after treatment with a Salt of Copper is not confined to dyeing upon yarn, but can also be applied to raw stock with corresponding benefit.

The Phenedine Browns include a range of shades, varying from a light yellowish brown to a deep brown-black, and by suitably combining other colors with them, the dyer has at his command a base, from which may be obtained any shade of brown, which may be desired, that the Phenedines do not produce. Like the Phenedine Blues, the browns readily admit of after treatment with Metallic Salts such as Bichromate of Potash or Bluestone, the result being materially increased fastness to light and washing, with but slight modification of shade.

The Phenedine Blacks are remarkable for their depth and purity of shade, and will be found extremely useful where brilliant blacks are required, particularly for plushes, velours, and other pile fabrics. For certain lines of hosiery the diazotizable Phenedine Blacks are to be recommended, as also for other classes of textiles that are to be dyed black, but which are not required to possess the distinguishing features of the well known St. Denis Black V, and the new type of the same group, viz., St. Denis Black B.

The Phenedine Greens are a separate and distinct series of products, which may be justly appreciated for their clear, bright tones, some of them being entirely different to any direct dyeing green heretofore introduced.

By suitable combinations with Phenedine Yellows or Blues all shades of green desired may be easily obtained.

The Phenedine Yellows are remarkable for the range of shades produced and their brilliancy. From the peculiarly pure yellow of the "C" type through the various gradations of shade to the mark "2/A" which has a pronounced reddish tone, are to be found any shades which are of immediate importance, for self tones, or combinations.

Besides the colors shown in the very comprehensive shade book now before us, we might also call attention to the exhibition of the shades of Cachou De Laval, Thiocatechines, and lastly, but by no means least, St. Denis Black V. Of the former, little need be said at this time, as they are products the properties of which are thoroughly well known. Respecting St. Denis Black, though, we may safely mention that it is a cotton coloring matter, entirely different chemically from the Phenedines, and possessing properties of value peculiar to itself and differing from any other dyestuff. The claims for St. Denis Black are broad and command the dyers' attention, viz., that it is unchangeable in shade, fast to all influences, whether of exposure, washing, fulling, milling, and cross dyeing, and is claimed to be the only product of its kind, which unites the above extremely valuable features with the additional ones of low cost and simplicity of application, indeed that no black coloring matter is as easy to manipulate. Dissolving the color, adding to the dye bath with the requisite quantity of common salt, then boiling the cotton yarn, raw stock or piece goods for about one hour, lifting and washing, constitutes the dyeing operation. This is followed by a simple passage for 25 or 30 minutes through a bath of either Bluestone or Chrome, according to the particular tone of black required, and a black is thereby produced which is absolute and permanent. No special care is essential, nor is it necessary to have any special machinery. No modification of the dyers' ordinary practices are required, simple, straightforward manipulation only being necessary. Messrs. Sykes & Street issue special circulars regarding this black, and will be very glad to communicate with all parties desiring to introduce the product in their dye-houses. For hosiery, St. Denis Black occupies a very high position, as well for the reasons above stated as for the additional reason that hosiery thus dyed does not crock or become "rusty" in tone, and does not have any injurious effect on cotton fibre, there being nothing in the dyestuff or chemicals used which impairs the strength of yarns dyed with it.

Decoloration of Rags.

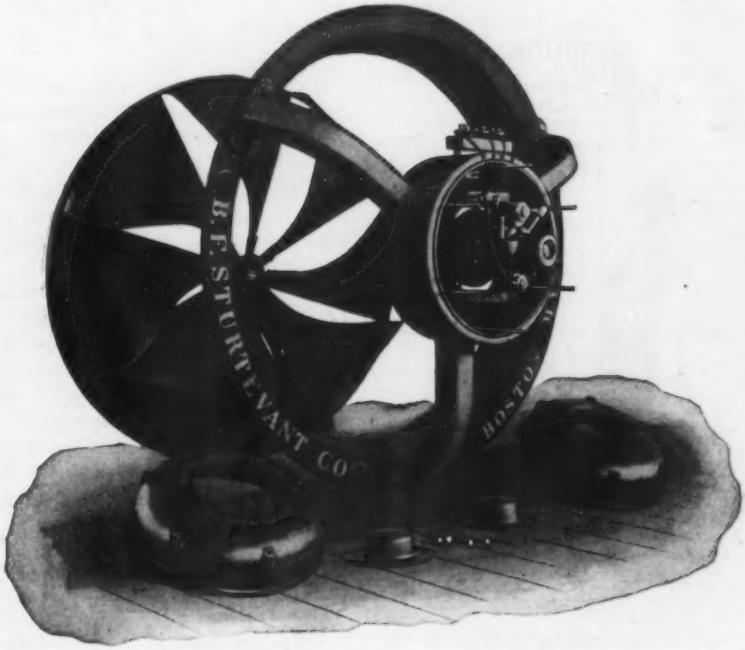
L'Industrie Textile mentions a process, recently discovered, for stripping the color from rags. It is claimed for this process, that the color is entirely removed, leaving the stock as white as when in its natural condition, and that the fibre is not injured in any way. It is stated that this is done by the use of hydrosulphite acid, a product of the action of bisulphite on zinc dust.

A New Type of Electric Propeller Ventilating Fan.

The B. F. Sturtevant Co., of Boston, has during the past year remodeled its enclosed motors designed for direct connection to propeller fans, and is now building a full line of these useful machines, ranging from 18 inches to 120 inches in diameter with capacities from 2000 to 175,000 cubic feet. The motor is of the bipolar type, entirely enclosed, and thereby protected from dust, a most important element in a machine used under these conditions. In order to avoid the excessive temperature which is incident to the operation of most enclosed motors, this type has been very carefully designed, so that a low temperature rise can be main-

tained without greatly increasing the size and weight above that of the ordinary open type. It is claimed that this machine is capable of continuous operation for ten hours, with a maximum temperature rise not exceeding 60 deg. F.

Yokes extending out from the field ring support the armature shaft. The end casings are entirely independent and can be instantly removed to give access to the entire interior. The bearings and brushes can be reached by simply removing the caps in the centre of the casings.



The brushes are of hard carbon, in holders of a modified reaction type, which allows of easy adjustment when it becomes necessary to reverse the direction of rotation of the motor. The bearings are self-oiling and self-aligning, and fitted with composition sleeves, which are removable from the outer ends of the boxes.

The design of the propeller wheel is the result of an extended series of comparative experiments with different types. The delivery edge is helical, and the form is such that the air is picked up at the inlet of the blade at low velocity, and when well under the influence of the blade accelerated to its maximum velocity with the least amount of slip. As a result, the efficiency is extremely high. The wheel is partially enclosed within a conoidal inlet ring, which decreases the frictional resistance to the entering air. By means of a tripod support the motor is accurately centred, and rigidly held in place, and the entire apparatus may with ease be bolted to the wall through which the air is to be discharged. The illustrations serve to make clear the general features of the design.

—We call attention to the prize offered for novel ideas or wrinkles in connection with knitting industry, to be found in knitting department.

—Notwithstanding the very large number of dyestuffs at the disposal of buyers, it is really wonderful with how few a dyer may work to produce a vast array of shades.

An Old Device in a New Field.

An endless belt elevator for the use of mill employees and light elevating work, will strike textile mill owners as something of a novelty, but the fact is, that during the past dozen years an elevator on this principle, known as the Humphrey Employees' Elevator, has been in very general use in the great flour mills and grain warehouses of the West.

It consists of a slowly moving 12-inch belt passing over pulleys at the top and bottom of the mill, carrying small platforms twenty feet apart, which continually ascend on one side and descend on the other. The platforms are designed to carry one man, and it is customary to get on and off without stopping the elevator. Of course, the mechanism is such that the platforms have a firm, positive motion, and shifting ropes give instant control of stopping and starting at every point, making it perfectly safe.

Thus a person on any floor, wishing to go either up or down, will always find one of the platforms at his disposal within a few seconds, while at the same time several other men may be riding on the other platforms at different floors of the mill.

Its great feature consists in the entire elimination of the man-killing stair climbing, which works directly against the efficiency of heads of departments, and employees, who have duties on the different floors. The elevator is also very useful for transferring packages between floors,—one man placing the packages on the platforms as they come along, and another man removing them at the receiving floor.

An elevator, that is a good thing for flour millers, is just as much of a good thing for the textile mills. Until now the manufacturers, F. W. Winter & Co., of Faribault, Minn., have been content with the flour milling trade, but a campaign is now on for textile mill business.

Mr. S. K. Humphrey, the inventor of the device, with office at 53 State St., Boston, is looking after the Eastern trade, and the Textile World has the pleasure of introducing to Eastern manufacturers a device, that bids fair to become as much of a necessity to the textile trade, as it now is to the great manufacturing industry of the West.

Mr. Humphrey will be glad to respond to any inquiries and furnish full information to persons interested.

—The Chinese fabric is invariably narrow, often not more than 12 or 15 inches wide, always of uncertain length, and of variable quality.

Over 11,000 lbs. of binding twine are made daily by the convicts in the Kansas State penitentiary. The warden reports the yarn to be of excellent quality, and that no difficulty is experienced in dispensing of the product.

QUESTIONS AND ANSWERS

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

Narrow Knitted Fabric.

Editor Textile World:

Can a narrow knitted fabric like the enclosed sample be made on a Branson knitting machine, and can an old style power machine be changed into a ¾ automatic? Heinro.

The enclosed sample is a plain, flat web with a selvage on each edge. This can be made on the Branson ¾ automatic machine, but the old style power machine cannot be satisfactorily changed into a ¾ automatic machine, for the reason that the automatic devices make it necessary to hold the cylinder more firmly and deeply in the clamp ring, and also requires other changes which would be more expensive than to set aside the old style machine and purchase a new automatic.

Counts of Raw Silk.

Editor Textile World:

I desire to become familiar with the counts of raw silks. Can you recommend to me a good book, which gives special information about this? Is the count of raw silks (Italian, Japanese, etc.) the same here and abroad? O. S.

The number of thrown silk is determined by the weight expressed in deniers, of a skein of 520 yards in length, reckoning 533⅓ deniers to the ounce. Another system is used in Manchester, Eng., where the number is determined by the weight in drams of a hank or skein of, 1000 yards.

On the continent of Europe various systems are employed for numbering silk yarn, such as: The Old Lyons, where the number equals the weight, in deniers, of 12,470 yards; the Turin, in which the number is the weight, in grams, of 9000 metres; and the International (French) system, in which the number of the yarn is the weight, in grams, of 10,000 metres of yarn.

Information regarding the numbering of raw silks can be found in "Power Loom Weaving," by Anton Gruner. We can furnish this book at $3. We have published in the Textile World, articles on the subject of numbering silk, from time to time, one of which can be found on page 96 of the January, 1900, issue. We believe the count of raw silks from the countries named is the same here and abroad.

Wages of Sewers.

Editor Textile World:

Please inform me in your Questions and Answers Department, what are the average wages paid to sewers in fancy woolen and worsted mills? Field.

One dollar per day is paid for this work in many mills, with which we are acquainted. In special cases, where an operative is more skilful than the average, this price is increased, and we have known $1.50 to be paid to such a sewer. In these cases, the girl generally has oversight of the work of the other sewers. The price varies in different mills, and many of them pay $1.25 per day.

Softener for Cotton Yarn for Knitting.

Editor Textile World:

Can you give us any information as to the softening of cotton yarn for knitting? We have tried several processes, but they do not give our customers satisfaction. Have you anything to suggest? B. D.

We believe that the soluble oil which is obtained from the castor oil plant is considered as good as anything for a softener after bleaching. There is a material called Anti-Chlorine (Bosson & Lane) on the market, which is used for a substitute for sulphuric acid in the chloride of lime process of bleaching. The manufacturers claim that this leaves the goods much softer than the acid process. We think the same parties also have a softener called Olo-Soffine.

Making Roofing Felt.

Editor Textile World:

Can you give me any information about processes of making roofing felt and what machinery is employed and where I can get it? How is the stock impregnated with coloring matter and dried? Enhance.

Can any of our readers furnish this information?

Cutting Corduroy.

Editor Textile World:

Perhaps some of your readers can inform us of a party who cuts and finishes corduroys, fustians and velveteens. If so, we should be glad to have their address.

New York Corduroy Mill.
124 Baxter St., New York.

We have given our correspondent the information by mail.

Different Systems of Worsted Spinning.

Editor Textile World:

What is the difference between English or Bradford system and French system of worsted spinning, and is there a German system?

Worsted.

The difference between the Bradford or English and the French systems of spinning worsted yarn is principally in the drawing and spinning processes. The main principle of the English system, is to draw the slubbing out and wind it on a bobbin by twisting it round with a flyer, and thus making a number of twisted ropes of wool, which are continually being redrawn and made over again. In the English system there are two methods of drawing, the open drawing and the cone drawing. In the open drawing method, the bobbin is loose on the spindle, and is dragged around by the slubbing. The bobbin increases in speed as it becomes fuller, and, consequently, the drag, or friction, increases, subjecting the slubbing to considerable strain. In the cone drawing, the bobbin is fastened by a peg on the spindle, and is turned around at a speed which increases as the bobbin fills up. The drag on the spindle is thus entirely removed. The advantages of the open drawing are more apparent in the working of short or tender wool.

The French system of drawing differs entirely from this. The principle adopted is to put no twist whatever into the roving, but keep each fibre as straight as possible, until it is spun. To effect this, a different class of machinery is used. The back rollers of the drawing box receive the slubbing as usual, and the front rollers draw them out, but between the two is the porcupine roller, which is a small brass roller, studded with needles about one-quarter of an inch long. The porcupine goes a little quicker than the back rollers, and serves only as a carrier to support the wool between the front and back rollers, as there is no twist in the slubbing. Having been drawn out by the front rollers, it passes between two rubbing leathers, similar to those of the condenser of a woolen card. As in the case on the wool card, they put no twist into the slubbing, but simply rub the fibres together and a round, pith-like thread is produced. This is wound on a bobbin lying horizontally. Such is the principle of French drawing. There are nine operations, each one being similar in its theory to the other, and merely differing in size as the rovings have to be made lighter.

The yarn, in the English method, is spun on a spinning frame, and the principle of this machine is the same as the English drawing system, previously described. By the French system, the yarn is spun on worsted mules. The combing process is practically the same in both cases, but the stock is combed dry for the French system, while by the English method it is oiled before being combed.

There is no other system of worsted manufacture besides the two above named. The English system has a tendency to keep the fibres nearer parallel to each other, and as a result the French yarn is somewhat fuzzier or more woolly, and on account of the absence of oil, the shrinkage of French yarn is less than that made by the Bradford system.

Flax Spinning.

Editor Textile World:

Can you recommend some publication treating of flax spinning, giving the rudimentary elements of same, and primary calculations in comprehensible language for a novice? B. G.

The best work that we know of on this subject is "Flax, Tow and Jute Spinning" by Peter Sharp, published in Dundee, Scotland.

New Publications.

The Knight of the Grip, reprinted from The Iron Age: New York, David Williams Co. 179 pages. Price 60 cents. This is an interesting account of the drummer's business, told in short sketches by one who has evidently been a close observer of the conditions under which the traveling man operates.

The author states in the preface that the book is not intended to instruct. This intention has evidently miscarried, for, while the reader is not bored by prosy maxims, the articles are of such a character as to instruct in the best possible way, namely, by leading the reader to draw his own conclusion.

The book will well repay perusal by both merchants and salesmen.

Fashionable Shades for Men's Wear; Farbenfabriken of Elberfeld Co. This card contains thirty-five shades for

men's wear goods, dyed in one bath on worsted cloth, and the collection will prove valuable to the manufacturer of men's wear, worsteds and woolens, in the selection of shades for new samples.

Formulas and directions for dyeing are given, also samples of the goods before coloring. The card can be obtained upon application to Farbenfabriken of Elberfeld Co., 40 Stone St., New York.

Machinists and Draftsmen's Handbook, by Peder Lobben, Mechanical Engineer, New York, D. Van Nostrand Co. Price $3.50. This book has been written with the object of presenting the information in such form as to be intelligible, and of the most practical value to the working mechanic. Abstruse theories and complicated formulas have been avoided.

The work begins with notes on mathematics, in which are treated arithmetic, algebra, logarithms, weights and measures, geometry, trigonometry and mensuration. Then follows a chapter on mechanics, in which are treated those subjects most likely to come into the every day experience of the practical mechanic; such as, pulley blocks, jack screws, horse power, derricks, belting, lacing, wire ropes, pulleys, fly wheels, shafting, bearings, gear teeth, worm gears, screws, etc., and chapters are devoted to notes on steam and hydraulics. It cannot fail to be a great help to the man in the shop.

Hoisting Engines and Appliances. Chicago, London: Fraser & Chalmers. This catalogue is issued to inform the trade as to hoisting devices for mines in general, and the various hoisting machines made by Fraser & Chalmers, either for special purposes according to order of their customers, or to meet the general requirements for hoisting mechanism in mines.

Many illustrations are given, also tables of proper working load for steel ropes, and for computing effective weight of load, etc.

Bulletin of the National Association of Wool Manufacturers, Boston, Mass. The June number of this publication has for its first article the interesting address by S. N. D. North, on the Federal Census of Manufacturers, before the National Association of Manufacturers, at its recent meeting in Boston. In the ninth chapter, which follows, on The New England Wool Manufacture, the history is brought from the tariff of 1816 down to that of 1824.

There are obituaries of J. G. Ray, Alan Cameron, Geo. L. Balcom, Howland Croft, Albert Tilt, and James Moir, and under the head of Editorial and Industrial Miscellany are treated various subjects of current interest.

Color Card. Leopold Cassella & Co., Frankfort, and W. J. Matheson & Co., have recently issued a card of colors on cotton and worsted yarns.

It contains 96 shades on cotton, and 66 on worsted, together with the formulæ for dyeing them. The colors cover a wide range from light to dark shades, and will be found useful to the dyer and also to the designer in the selection of shades.

Care has been taken to describe the general process of dyeing each color, as well as giving the percentage of dyestuff.

Twenty-four (24) of the cotton shades are colors fast to washing, and directions are given for handling the other cotton colors in the finishing process.

The formulæ and directions are printed in English, French and German.

The Whitin Machine Works. Whitinsville, Mass. The 1900 edition of the illustrated catalogue, issued by this company, has just been received.

While describing the various machines for carding, combing, spinning, weaving, spooling and twisting cotton, it contains valuable change gear and production tables; twist tables for frame warp and filling, mule warp and filling, hosiery yarn and yarn for doubling; tables of breaking weight of yarn; twist tables for twisting yarns; yarn tables for numbering yarn by grains.

There are also diagrams showing floor space occupied by the different machines. The book is of convenient size and is well bound in an attractive style. It will be found useful to all engaged in cotton manufacturing.

Buffalo Forge Company's Down Draft System.

The merits of the down draft system, applied to forges, commends itself by reason of the absence of smoke and dust from the room, and as the heat from the fires does not radiate through the workrooms, the workmen are much cooler and comfortable.

The system of down draft, installed by the Buffalo (N. Y.) Forge Co., has been in use for a long time, and the following letters from one of their customers is convincing evidence of the efficiency of this method:

Lowell, Mass., Feb. 14, 1900.
Buffalo Forge Co., Buffalo, N. Y.

Gentlemen:—Replying to your inquiry of the 10th inst., would say we are well pleased with the system of down draft forges furnished by you about two years ago. We have had no trouble with smoke from our blacksmith shop since its adoption.

Yours truly,
Kitson Machine Company.

Regarding the Buffalo system of down draft the master mechanic of Peoria & Pekin (Ill.) R'w Co. writes:

"We are highly pleased with your down draft forge shop equipment, purchased over three years ago. It is cooler for the men, as the heat is carried away from them, and is superior to the overhead method."

The general manager of the Verity Plow Co., Brantford, Ont., says: "The Down Draft Forges, installed by the Buffalo Forge Co., have given us the very best satisfaction. Our shop is free from smoke and gas."

Z. R. Brockway, general superintendent, Elmira (N. Y.) Reformatory, writes the Buffalo Forge Co. as follows: "No comparative statement can properly be made between down-draft and overhead method of smoke removal, as the overhead system which we have used is so very objectionable and unsatisfactory,

and the down-draft method is so efficient and satisfactory.

"If I were to install a new plant, I should secure the down draft, and should try and secure an instalment by the Buffalo Forge Co., as we have had such good experience with your work."

H. G. McKerrow & Co.

H. G. McKerrow & Company, Boston, Mass., the agents for Tweedales & Smalley's machinery report the following orders taken recently: Winder Cotton Mills, Winder, Ga., complete equipment of cards and drawing frames; American Thread Company, cards, drawing, slubbing, intermediate and roving frames for their new mill at Willimantic; new cards, drawing and speed frames to be installed at the American Thread Company's mill at Holyoke; new cards, drawing, slubbing, intermediate, roving and jack frames for the American Thread Company's mill at Westerly, R. I. The orders placed with this firm by the American Thread Company, aggregate over 175 different machines.

—The Fay Stocking Co., Elyria, O., recently added ten new Scott & Williams leggers, five Victor footers, two Union Special seamers, two coverers and one edger. This plant is being improved and enlarged all the time.

—The Berlin Iron Bridge Co., of East Berlin, Conn., have received the contract for thirteen important bridges on the N. Y., N. H. & H. R. R. Ten of these are large heavy four-track bridges, and three of them are to carry highways over the tracks. Six of these are located at Bridgeport, Conn., and are plate girder bridges for carrying four tracks over streets. There is also a very long, heavy, four-track riveted lattice bridge located near Boston, on the Plymouth Division. All the work is to be completed by October 1st.

—H. G. McKerrow & Company, of Boston, Mass., the agents for Tweedales & Smalley's machinery, report the following orders taken recently: Fall River, repeat order Mechanics Mills, intermediate frames; Granite Mills, jack frames; Narragansett Mills, intermediate and roving frames; Hargraves Mills, fourth repeat order for slubbing and intermediate frames; Carolina Cotton Mills, Greenville, S. C., cards and drawing frames; Thomaston Cotton Mills, Thomaston, Ga., cards and drawing frames; Magid-Hope Silk Co., Milford, Mass., first instalment of silk machinery.

Specification of Paint.

Architects, consulting engineers, owners and persons interested in the subject of protective paint for steel structures, will receive a handsome card illustrating several eighteen story steel structures upon which Dixon's Silica-Graphite Paint has been used, if they will send their address to the Joseph Dixon Crucible Co., Jersey City, N. J. The card also contains suggestions for specification of the paint, and its well-known durability has led to its specification and use upon many immense steel viaducts, bridges and manufacturing plants all over the world.

R. B. Denny.

The recent sales of the Daleville Mill, East Willington, Conn., to Dennison Walker, and also that of the Rochester (Minn.) Woolen Mill to a new corporation, were made through R. B. Denny, mill broker, 143 Federal St., Boston, Mass. Mr. Denny also negotiated the sale of the mill village, known as Crossleyville, or South Barre, Mass., to Francis Willey & Co., Boston.

Mechanical Draft.

The interest which this subject is attracting at present is indicated by a statement which was recently made by the B. F. Sturtevant Co., Boston, that their sales of apparatus for stationary boiler plants were last year more than three times those for the preceding year, and that their daily sales now amount to nearly 1000 H. P. per day, about equally divided between marine and stationary plants.

This company also reports that mechanical drafts apparatus has been installed in a number of technical schools of the country for the purpose of instruction in the subject, as well as ventilation of the rooms.

Lockwood, Greene & Co.

This well-known firm of mill engineers and architects has for several years been finding their former quarters at 131 Devonshire St., Boston, growing too small for their increasing business, and the great rush of work in the last two years made it imperative that a change should be made to larger and more convenient quarters. Room by room they had added to their space, until they were occupying parts of four different floors in two different buildings. When the large building at 93 Federal St. was remodeled, the desired opportunity of getting a large, well-lighted space on one floor presented itself, and they secured the entire sixth, or top floor and remodeled it for their purpose. Every convenience for the transaction of their business is at hand. The draughting room is a very large, cheerful and well-lighted apartment, where their 40 draughtsmen find ample accommodation, with room for more. Adjoining the draughting room, is the head draughtman's office and the stack room, where the plans are systematically filed in a fire-proof compartment and conveniently indexed for quick reference.

Mr. Greene's handsomely furnished private office is in the centre of the suite, with an ante-room leading from the general business office, where the bookkeeping and clerical force, in charge of Mr. Harris, have their desks. Nearby is the stenographers' and typewriters' room. On the other side of the general offices are those of Mr. F. E. Shedd, the mechanical engineer in charge of the construction department. Mr. Shedd's office adjoins that of the sketching and planning department, and nearby is the office of Mr. W. L. Church, head of another department. Adjoining the working offices, but yet separate from them, is a large office for the use of their customers and friends, which they may use as headquarters when in Boston, where appoint-

ments can be made and business transacted. Electric and telephone connection between the different rooms makes communication easy.

The list of mills built and remodeled by this concern is like a section out of a textile directory, and in their new quarters they are better fitted than ever for giving their clients prompt attention.

The new suite was opened by a reception to their business friends on June 19th, from 2 until 6, and the entire staff were present to greet visitors and show them about the offices, and a handsome collation was spread.

Mr. Ainley's Experience with Stephenson's Bar Belt Dressing.

Speaking of the difficulties experienced by loom fixers in keeping the looms running at a uniform speed, Mr. A. Ainley, who is connected with the Washington Mills at Lawrence, Mass., and who has written a treatise on Woolen and Worsted Loom Fixing, recently said that he had never found anything quite so helpful in its line as Stephenson Bar Belt Dressing.

Going into details, he remarked that he had used a great many pound sticks of it and that he found, while it kept the belts in very good condition, it commended itself to him more particularly because it was always near at hand, ready to be applied in an instant, whenever there was any diminution or variation in the speed.

Another point that he brought out, which is of interest to mill owners, was the fact that in applying this dressing to a belt it was not necessary to shut down, and there was no chance of its spattering on the warp.

The Stephenson Manufacturing Co., of Albany, N. Y., makers of this belt dressing, say that they attribute their largely increased business to the fact that their product is recommended by one satisfied user to another (who may not have heard of it).

The company goes farther than that in seeking new customers by sending anyone interested a testing sample, free of charge, by mail, post paid.

A postal card request addressed to the company at Albany, N. Y., is all that is necessary.

Warren's Pulley Cover.

The Warren Mfg. Co., of Chicago, manufacturers of Warren's Pulley Cover (applied with a brush), have recently published an entertaining and well-printed folder describing the use and merits of their cover. This cover, it seems, gives a pulley a leather-like surface, which has natural adhesion for belting.

In this folder, they set forth the idea that metal pulleys and leather belts have no natural affinity for one another and therefore were not intended to work together. They believe that man by making his pulleys of metal and his belts of leather has attempted to force metal and leather to an unnatural union and thus has fought natural laws; that he has necessarily met with a failure. The result of this failure is, of course, belt slipping or belt creeping, with a material loss of power and capacity. They claim that anything that tends to stick the belt surface to the pulley surface will tend to increase the resistance to be overcome by the engine.

They will take pleasure in submitting further information to all interested. This, they believe, should include all users of belts.

Air Moisteners.

Repeat orders, the most convincing evidence of merit, have been received by the American Moistening Co., Boston, Mass., for their Humidifiers, from the following mills: The Massachusetts Mills, Lowell, Mass.; The Grosvenor-Dale Co., No. Grosvenor, Conn.; The Hamilton Mfg. Co., Lowell, Mass., and The Corr Mfg. Co., Taunton, Mass. The moisteners are being placed in the Trenton Cotton Mills, Gastonia, N. C.

American Correspondence School of Textiles.

The American Correspondence School of Textiles, New Bedford, Mass., is receiving a large number of inquiries from mill men all over the country, and also from abroad, as to the methods and courses of instruction.

These men desire to make arrangements, by which they can commence their courses of instruction in the late summer or early fall without any delay.

A large number of the successful students of this school have received higher positions and have improved opportunities on account of the knowledge that they have derived from their studies.

Lamb Knitting Machine Co.

The knitting machine and foundry business, formerly owned by the American Bicycle Company, Chicopee Falls, Mass., has been purchased by a new company, which was organized by F. D. Howard, and which will continue the business at the same place.

The first meeting of the stockholders of the new company has been held, and the following were elected directors: Robert Russell of Holyoke, J. E. Woodhead Chicago, Ill., James L. Pease of Chicopee, H. P. Norris of this city and F. D. Howard of Chicopee Falls. Robert Russell was elected president, J. E. Woodhead vice-president, Charles J. Seaver of Chicopee Falls clerk, and F. D. Howard treasurer and manager. Mr. Woodhead will be the Chicago selling agent, and L. D. Sanborn will be the agent at New York.

The new company propose to manufacture the regular Lamb machinery and also other valuable machines in the knitting line.

Mr. Howard's long experience in the business and his wide acquaintance with the trade will be valuable acquisitions to the new company's equipment, which starts its career under most favorable conditions. Both Messrs. Woodhead and Sanborn have long been identified with the old Lamb Company, and are known to all its customers.

American Enterprise at Paris.

Among the striking and original exhibits at the Paris Exposition of 1900 few have occasioned more favorable comment than the great map of the United States, 18 by 15 feet, exhibited by the well-known advertising agency of Lord & Thomas, Chicago and New York. This map is constructed to show at a glance the various details concerning state areas and population, number of publications in each, circulation per issue, percentage of circulation to population, value of publishing plants, number of employees, average hours of labor, average wages paid and average cost per inch for yearly advertising. Information of this nature is of especial value to advertisers, showing as it does the best locations in which to place advertising, to reach the greatest number of people and secure best results.

The firm of Lord & Thomas has been engaged in the general advertising business for over thirty years, and ranks among the largest in its line. They prepare advertisements for all classes of advertisers and place them in any publication in the world.

Copies of this valuable map will be sent free on request to all advertisers who address Lord & Thomas, Trude Building, Chicago.

American Moistening Company.

Among the repeat orders received by the American Moistening Company, Boston, Mass., we note the following: Hope Mills Manufacturing Co., Hope Mills, N. C.; Erben, Harding & Company, Philadelphia, Pa.; George H. Gilbert Mfg. Co., Ware, Mass.; and the Merchants' Cotton Mills, Montreal, Que.

Orders have also been received by same company for humidifying equipment from the Waxahachie Cotton Mills, Waxahachie, Tex.; Royal Cotton Mills, Wake Forest, N. C.; Columbus Manufacturing Co., Columbus, Ga.; Eagle & Phoenix Mills, Columbus, Ga.; Norris Cotton Mills, Cateechee, S. C.; and the Lockwood Co., Watervilie, Me.

Their Best Month.

The Morley Button Mfg. Co., 68 Essex St., Boston, Mass., state that their sales on their Morley Travelers during the month of June surpassed any previous month they have ever had. They have recently issued a new price list and will gladly forward the same, together with samples of traveler, to any mill desirous of trying them.

Uniform Speed of Belts.

This very essential result in the running of belts for textile work cannot be reached where there is any slipping of the belt whatever. Yet the slipping cannot be stopped by the use of any mechanical devise or preparation which may injure the belt.

It is on these two points that Cling-Surface is especially recommended by its makers, who guarantee it to stop all slipping without making the belt sticky permanently. Its use results in easy belts, running with uniform speed, and makes and keeps them pliable, elastic and in perfect condition. The manufacturers will be very glad to advise belt users of results to be obtained in their mills.

E. G. Siggers.

It is not generally known that patents involve property rights as much so as real estate, and the same care usually exercised in the purchase of real property should also prevail in purchasing patents. An intending purchaser of real estate never completes his purchase until the title thereto has been thoroughly investigated, and business caution dictates that the same practice should be followed by purchasers of patents. E. G. Siggers, Patent Lawyer, Washington, D. C., with an experience of 20 years in the business, is well qualified to give reliable advice on this subject.

An Open Letter.

Fred'k Victor & Achelis
Importers & Commission Merchants.
64 to 76 Leonard Street
P.O. BOX, 187.

Dict'd by G. F. V.

New York, Aug. 26, '9[illegible].

The Bates Machine Co.,
New York.

Gentlemen:--

We consider it an important detail in the finishing of goods to print the yardage, and the numbers describing them, upon the tickets in a legible and uniform manner.

Written tickets are always liable to be misread--causing vexatious delays and expense --while the tickets we receive from our manufacturers who use your special machines are filled out with absolutely clear and neatly printed figures, which would materially improve the appearance of any ticket, label or sample.

We shall strongly recommend your machines.

Yours truly,

Fred'k Victor & Achelis

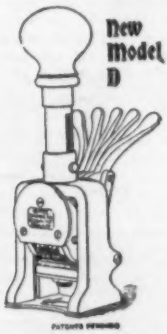
The views exoressed in this letter represent the concensus of opinion among commission merchants, converters, jobbers and the trade generally. The ticketing of woolens, the labeling, banding and wrapping of silks and cottons, the boxing and marking of knit goods, and the general appearance of all samples have been very much improved in the last few seasons by the efforts of several prominent commission houses, who realized quickly that the improvement was a factor in selling the goods, and contributed in no small degree to de-

crease complaints and claims and reduced errors to a minimum.

Attention of manufacturers was drawn to the fact that mill hands are often very poor writers, and the use of rubber stamps for this purpose is not productive of legible and uniform results; consequently the effect of attractive, and

often expensive tickets, labels and sample cards is lost when either of these methods of filling in the necessary numbers and letters is employed; the claims for "shortage" are increased, when the number of yards are indicated by undecipherable writing or stamping; errors creep in when taking off the style, piece and case numbers, resulting in correspondence of an irritating nature, if not an actual money loss.

As a direct result of this agitation, up-



wards of a thousand progressive mills have been equipped with ingenious little machines specially designed for the purpose, and made with indestructible steel figures, which produce beautifully clear and accurate work, as illustrated by the ticket of the Dunn Worsted Mills. The numbering and lettering of cards and tickets of every description have been reduced to an exact science, and machines are now provided to meet every possible requirement of the finisher of woolens, worsteds, carpets, cottons, silks and knit goods.

With recently improved attachments, tickets, labels and wrappers are numbered after having been attached to the goods, with perfect results. In addition to figures and letters, dashes, oblique lines, words and special characters of any kind, are provided.

The setting and resetting is almost instantly accomplished by the levers in the rear of the machines, and ordinary finishing-room hands quickly acquire surprising rapidity and accuracy. The Bates Machine Company, New York Life Building, Broadway, corner Leonard Street, New York, will furnish catalogues and full particulars upon application. These machines are also used extensively in England and are for sale at the company's branch office, 2 Cooper Street, Manchester, which is in charge of F. B. Knott.

Fine Ocean Resorts on New England Coast.

In no section of the country can so wide a variety of shore resorts be found as on the North Atlantic Coast. For the fashionable set, Bar Harbor and vicinity has long been a favorite resort, but York, Marblehead, Manchester, Rye, The Hamptons, Kennebunk, Old Orchard, Scarboro and a hundred others are watering places to which multitudes flock early in the season, and the satisfactory results of the summer's sojourn are evidenced by the brown faces, bright eyes and jovial spirits which one encounters at the end of the season.

Have you thought of a vacation trip yet? If not, you should have the "All Along Shore" book published by the Boston & Maine Railroad, and by addressing the General Passenger Department, Boston, Mass., enclosing a two-cent stamp, the book will be sent you. It will materially aid you in selecting your outing place.

The Dubois Fast Black for Hosiery.

The Dubois Sanitary Fast Black Process is being introduced by a number of leading dye works and hosiery manufacturers, and Calmore & Co., 501 Chestnut St., Philadelphia, who are agents for it, feel gratified that their old customers, as well as new ones, continue to report such satisfaction. Among those recently adopting this process are the Blue Ridge Knitting Co., at Hagerstown, Md.; the Pond Lily Co., at Westville, Conn.; and the new Mathis & Davis Co., at East Chattanooga, Tenn.,, the latter being the first mill to have the No. 1 process installed. We have several times before mentioned this admirable black, which is fast, easy to produce and costs but very little. The formula is for sale and a competent chemist goes to give personal instruction and start the work.

—Among the orders for American goods which are coming in from new enterprises in Cuba, is an order for Cross Oil Filters to equip a large, new electrical power house in Havana.

List of Textile Patents.

Issued June 5, 12, 19 and 26, 1900.

(Continued from page 29.)

Loom Take-up Mechanism, Narrow-ware. 651,614. J. and C. Salathe, New York City.

Loom Warp Stop-Motion. 651,813. J. F. Dustin, Fitchburg, Mass.

Loom Seat. 651,917. J. B. Bolton, New Bedford, Mass., assignor of one-half to Alex. D. Astley, same place.

Loom Tuft Weaving and Cutting Device. 651,852. Otto Hallensleben, Hilden, Gy.

Loom Warp Stop Motion, Electrical. 652,223. H. I. Harriman, New York City.

Loom for Weaving Hair-cloth, Stop Motion for. 652,206. J. W. Clark, Pawtucket, R. I., assignor of one-half to the Collyer Mch. Co., same place.

Loom Shed-forming Mechanism. 652,434. C. A. Littlefield, Lowell, Mass., assignor to the Draper Co., Portland, Me., and Hopedale, Mass.

Looms, Positive Shuttle-Motion for. 652,498. W. I. Whitehurst, Baltimore, Md.

Measuring Device for Rolled Goods. 651,891. Hy. Sauls and Geo. S. Cook, Mineral, Tex.

Pile Cutting Machines, Weft. 650,968 and 650,969. Oscar Drey, Manchester, Eng.

Plaiting Apparatus. 651,181. T. F. Byrne, Phoenixville, Pa.

Spinning Mule. 652,203. J. D. Whyte, Urmston, Eng., assignor of one-third to Hy. Stafford Golland, Worsley, Eng.

Spinning Flier. 652,306. J. Weber, Uster, Switzerland.

Tags to Clothing, Machine for Attaching. 651,218. G. H. Wilkins and E. E. Lambord, Portland, Me., assignor of two-thirds to A. L. and A. I. Merry, same place.

Weaver's Pliers. 652,359. Geo. Haigh and Chas. Houck, Utica, N. Y., assignors to the Utica Drop Forge & Tool Co., same place.

Winding Drum Indicator. 652,546. W. F. Murray, San Francisco, Cal.

Winding Machine. 652,449. D. G. Baker, Willimantic, Ct., assignor to Am. Thread Co., New York City.

Winding Machine. 652,572. S. W. Wardwell, Jr., Providence, R. I., assignor to the Universal Winding Co., Portland, Me.

Winding Machine, Thread. 652,646. John F. Schenck, Lawndale, N. C.

Winding Machine Tension Device. 651,219. S. W. Wardwell, Jr., Providence, R. I., assignor to the Universal Winding Co., Portland, Me.

Wire Fabric, Knit. 651,557. A. M. Reeves and Harry Wheeler, Indianapolis, Ind.

Wire Fabric Machine. 651,785. Peter Sommer, John Sommer, and Peter W. Sommer, Peoria, Ill.

Cohoes Foundry and Machine Company.

The large factory adjoining the machine shop and foundry of the Cohoes Foundry & Machine Co., Cohoes, N. Y., was recently destroyed by fire, which communicated to their property and did some damage, destroying out-buildings and pattern storehouse. Their main buildings were, however, damaged but slightly, and the loss is mainly on patterns. They will lose no working time on account of the loss sustained, and will proceed, as before, completing present contracts as well as filling new ones with dispatch.

Persons Seeking Homes.

Persons seeking homes or investments, or firms and corporations seeking locations in the South and who desire information about Tennessee would do well to address Robert Gates, special industrial and immigration agent, Louisville & Nashville R. R. for Tennessee, at Nashville, Tenn.

—Among the repeat orders for humidifiers recently received by the American Moistening Company, Boston, we notice the following: Montreal Cotton Co., Valleyfield, Que.; Parker Mills, Fall River, Mass.; South-Side Manufacturing Company, Salem, N. C.; Thomas Wolstenholme & Sons Company, Philadelphia, Pa.; Utica Steam Cotton Co., Utica, N. Y. In addition to the above, the Rushton Manufacturing Co., Griffin, Ga., and the Rockford Mitten & Hosiery Co., Rockford, Ill., are equipping their mills with the American Moistening Company's system of humidifiers.

—The Hamilton Mills, Lowell, Mass., is installing a labor saving conveying system. It is a large suction pipe, 200 feet long, connecting the store house and the picker room. When finished, the cotton will be drawn through the pipe, by means of suction, from the store house to the picker room. The new arrangement will supersede the present method of transporting the cotton by horse power.

—The Lowell Machine Shop has just issued a catalogue of its machinery, in Spanish. This is probably the first catalogue of textile machinery published in this language by an American firm. It consists of 121 pages, 12 by 9 inches, and contains a glossary in the back part of Spanish and English equivalents.

—J. Howell Jones, 18 Burling Slip, New York, has made arrangements with the estate of Charles S. Norton of Philadelphia and New York to continue the sale of the goods formerly sold by the late Mr. Norton's house, and will add that to his line of aniline colors and dyestuffs.

—The Trusts are proving a good thing for The Burt Mfg. Co., Akron, Ohio. Among their recent shipments are Cross Oil Filters for the Carnegie Steel Co., Am. Steel Hoop Co., Am. Sheet Steel Co. and their 14th order for the Am. Tin Plate Co.

MILL NEWS.

Cotton.

New Mills.

—*Alabama, Demopolis. It is reported that the project for a cotton mill at this place will prove successful as it is thought that satisfactory arrangements will be made in a few days. The company will be organized with a capital of $100,000, one-half to be taken by Northern capitalists, the other by local men. W. N. Henderson, immigration agent for the Southern Railway, is interested.

—Alabama, Huntsville. A 10,000 spindle cotton mill, bleachery and print works is to be erected here by Arthur H. Lowe, president of the Parkhill Mfg. Co., Fitchburg, Mass., and others. Sixty acres of ground were donated by the citizens and the plant will be exempt from taxation for seven years. Yarns No. 30 to 40 will be made. About $300,000 will be expended on the new enterprise.

—Alabama, Huntsville. The Madison County Spinning Company has been organized here with capital of $100,000 by Major T. B. Dallas, J. R. Stevens, W. R. Rison, H. H. Echols and others. A fine grade of jeans will be manufactured, giving employment to about 500 people.

—*Alabama, Prattville. A new company is to be formed in which J. T. Floyd of Prattville and Frederick Ausfelt will be interested, to rebuild and operate the Old Indian Head Mill near this place and equip the same with machinery for manufacturing sheeting, largely for export trade. The mill firm which will be capitalized at $250,000, will be known as the Victory Cotton Mill. The building will be 80 by 300 feet, and will have a capacity of 4600 pounds of sheeting cloth per day. Plant will be equipped with 10,000 spindles and 300 looms.

—*Alabama, Roanoke. Plans have been completed for the new mill to be erected here by the W. A. Handley Mfg. Co., of which W. A. Handley is president, and work will be started soon on construction. It is expected to have the plant completed ready for operation by February, 1901.

—*Arkansas, Hamburg. Osnaburgs, Brown Drilling, Plaids, Cotton Rope, Twine, etc., will be manufactured by the Hamburg Cotton Factory Assn., recently organized with capital of $100,000. The plant will be operated by steam. A dye house will also be attached.

—Georgia, Athens. A new cotton mill is to be erected here with equipment of 2500 spindles, which number will be doubled as soon as possible after the plant has begun running. At a recent meeting of the stockholders, Lakin C. Hightower was elected president; Clinton D. Glaze, vice-president; C. E. Frost, secretary and treasurer and T. M. Hobbs, general manager. The buildings and power will be double the capacity of the plant in order that the plant may be enlarged at any time.

—*Georgia, Covington. The Covington Mills have been organized with capital stock of $100,000. Plant will be equipped with 5000 spindles and 60 looms. Operations will probably start about December 1st.

—*Georgia, Dallas. The plant of the Paulding County Cotton Mfg. Co., capitalized at $200,000, and of which E. Davis is president, expects to begin operations about October 1st, spinning hosiery yarns.

—*Georgia, Dublin. Contract has been let for the erection of the Dublin Cotton Mills, recently incorporated with capital of $100,000. Work will be started at once on construction.

—Georgia, Nomer. The Baldwin Cotton Mills have recently been incorporated with W. A. Shore, as president; W. D. Lewis, secretary; P. G. Ducket, treasurer and Cuyler Smith, general manager.

—*Louisiana, Clinton. Operations have begun in the Clinton Yarn and Cotton Mills, of which D. W. Pipes, is president; H. H. Forrester, secretary and treasurer and D. P. Rodman, superintendent. They manufacture coarse yarns, running 3000 spindles with steam power, and give employment to about 30 hands.

—*Louisiana, New Iberia. J. P. Suberville is president, A. B. Murray, treasurer and Leopold Levy, secretary of the New Iberia Cotton Mill Co., recently incorporated with capital of $100,000. They will soon be in the market for everything necessary for such a plant. As previously stated, contemplate starting with equipment of 5000 spindles.

—*Masaschusetts, Fall River. The capital stock of the American Cotton Mfg. Co., $1,000,000, is to be divided into 40,000 shares of $25.00 each, to be paid for on installments, as called for by the directors, $5.00 on each share being payable July 1st. Work will now be started on securing subscriptions.

—*Mississippi, McComb City. The McComb City Cotton Mill Co., which has started work on construction of building, will have the plant equipped with 5000 spindles and 150 looms. Orders have been placed for the machinery.

—*New York, Rochester. The Rochester Textile Works, recently incorporated with capital of $52,000, L. P. Warner president, and F. E. Williams secretary and treasurer, have not yet decided when they will start operations. The plant will be located at 235 Mill St. Braids, coach lace, etc., will be made, company purchasing yarns.

—*North Carolina, Clayton. The Clayton Cotton Mill Co., recently incorporated with a capital stock of $120,000, will equip the plant with 7500 spindles for making yarns. We have previously given report on this mill.

—North Carolina, Winston-Salem. The Wachovia Mills Co. has been organizer with capital stock of $20,000, which is to be increased to $50,000. The incorporators are: H. W., J. W., F. H. and H. E. Fries, Nat Sullivan, G. L. Dull,

Charles Shelton, W. H. Turner, N. S. and T. J. Wilson. The plant now operated at Salem, by F. & H. Fries, will be removed to this place and greatly enlarged. Buildings are to be erected at once. Mills will be operated by electricity.

—Pennsylvania, Philadelphia. The Wabash Mills Co., is a new concern recently incorporated at Manayunk. Arthur A. Leeds is president; Walter P. Stokes, treasurer, and Sam'l Stead, superintendent. The plant is equipped with 2650 spindles for manufacturing cotton carpet yarns. The plant will be operated by steam. Goods will be sold direct. Philadelphia office is at 208 Church Street.

—Pennsylvania, Reading. The Reading Industrial Company has been recently incorporated by Emanuel Thalheimer and Mahlon H. Seidel, with a capital stock of $50,000. They manufacture handkerchiefs, lace and embroidery, employing 65 hands. They contemplate erecting a large brick building, 30 by 115 feet, 3 stories high. Several new machines will be purchased and installed in the new addition.

—*Rhode Island, Bristol. The plant of the new Dixon Yarn Mills, to be located at this place, will have an equipment of about 25,000 spindles, for making combed yarn. So far, more than half of the capital stock, of $250,000, has been secured. Those interested in the project have been previously mentioned.

—*Rhode Island, Greenville. The plant of the Elite Mfg. Co., incorporated with capital of $50,000, John Smith, president; T. W. Power, secretary; A. C. Buell (Banigan Bldg.), Prov., treasurer and James Ashworth, Jr., supt., will be located at this place. Plant will have an equipment of 50 looms for making cotton plush. They will make their own yarns, beginning operations about July 1st.

—*Rhode Island, Pawtucket. Part of the machinery is now being installed in the American Textile Manufacturing Co.'s plant, a concern recently incorporated with capital of $300,000, Hezikiah Conant, as president and George M. Thornton, treasurer, for making fine laces for edgings, underwear and drapery purposes. They have recently completed the erection of a three-story brick mill. Charles W. Shepard is manager of the concern.

—*South Carolina, Gaffney. The main building of the Limestone Mfg. Co., of which J. A. Carroll is president, will be 100 by 311 feet, 2 stories high, with annexed boiler and engine house, 100 by 40 feet. It is expected to have the plant ready to begin operations about the first of October.

—*South Carolina, Greenville. The Carolina Mills, which at first contemplated starting operations with 3120 spindles, will begin with 5000 instead. All orders for machinery have been placed. This plant expects to start up about August 1st.

—South Carolina, Hartsville. J. L. Koher of Hartsville; T. E. Moore and C. C. Twitty of Spartanburg, and D. A. P. Jordan of Greenwood, have incorporated the Hartsville Cotton Mill with a capital stock of $250,000. It is proposed to begin erection of building at once.

—*South Carolina, Lancaster. The Lancaster Cotton Mills, which we recently reported had increased the capital stock to $1,000,000, will erect an addition, which will be a complete 50,000 spindle plant, at a cost of about $850,000. This is the concern of which Leroy Springs is president and manager and refers also to report made June 1st, of his interest in erecting a 50,000 spindle plant here.

—*South Carolina, Leesville. Work will soon be started on construction of the Leesville Manufacturing Co.'s plant, which will be equipped with 9000 ring spindles and 240 looms for making sheetings. Goods are to be sold through H. J. Farber, Drewry & Co., of New York, N. Y.

—*South Carolina, Whitmires. The Glenn-Lowery Manufacturing Company has been organized with capital of $300,000, and Wm. Coleman, of Charlotte, N. C., as president. About 15,000 spindles will be installed. Steam power will be used.

—Tennessee, Athens. A site has been purchased by the Athens Cotton Mills Co. for their mill. Work will be started and pushed as soon as plans are received from the architect.

—*Tennessee, Fayetteville. Work has been started on the foundation for the Elk Cotton Mills, recently incorporated with a capital of $100,000. Employment will be given to about 600 hands, the company contemplating operating by day and night.

—*Tennessee, Humboldt. The Humboldt Cotton Mills, which have recently been incorporated by C. H. Fennell, J. R. Farrell and others, with capital of $100,000, will have equipment of 3500 spindles and 100 looms.

—*Tennessee, Knoxville. The Knoxville Cotton Mills, recently incorporated with capital of $250,000, C. M. McGhee, president; C. T. Leonhardt, treasurer and L. D. Tyson, vice-president and general manager, will manufacture hosiery yarns, Nos. 6s to 30s. The plant, now under construction, will be equipped with 10,000 spindles, with steam as the motive power. They expect to begin operations about Oct. 1, 1900.

—*Texas, Gonzales. Estimates are now being received by J. P. Randle, president of the Gonzales Cotton Mills, for building the structure of new mill which will be 75 by 150 feet, 2 stories, and an equipment, consisting of 5000 spindles and 100 looms for making white and coarse brown goods.

—*Virginia, Roanoke. The plant of the Roanoke Cotton Mill Co. will be equipped with 5000 spindles for making ball twine, and yarn in cones, tubes and skeins. Estimates on the machinery are now being received by Ed. L. Stone, treasurer of the company.

—*Virginia, So. Boston. The Century Cotton Mills, which have recently been incorporated with a capital stock of $100,000, and of which T. S. Wilson is president, and F. A. Lukin, treasurer, will manufacture cotton yarns for the present, operating 5000 spindles. An entire new building is to be erected.

Enlargements and Improvements.

—*Alabama, Huntsville. The machinery is now being placed in the first addition of the Merrimack Mfg. Co.'s plant. The mill will be put in actual operation in a few days.

—*Connecticut, Willimantic. A two-story addition is to be built to No. 4 mill of the American Thread Company, as soon as the present mill, now under construction, is completed. The new addition will have a capacity of running 40,000 spindles.

—*Georgia, Jackson. The new addition to the Pepperton Mills has been completed and the machinery is now being installed. The equipment will consist of 8500 spindles and 250 looms, a 500 h. p. engine and three 300 h. p. boilers.

—Maine, Augusta. The Edwards Manufacturing Company contemplates making extensive improvemnts to the plant. A number of the old looms will be replaced by 600 new ones, the work of installation beginning about the first of July.

—Maine, Lisbon. It is reported that additional machinery, consisting of looms, is to be installed in the Farwell Mill at this place, since the company has started making a new fabric called curtain lenos, for which there is quite a demand.

—Maryland, Laurel. Extensive improvements, costing about $20,000, are being made to the Laurel Mills Co.'s plant. The company has a large government contract.

—Massachusetts, Chicopee. The Dwight Manufacturing Company is having 500 new looms installed in their plant by the Draper Machine Co., of Hopedale, Mass.

—*Massachusetts, Chicopee Falls. Work is now being pushed on additions under construction for the Chicopee Mfg. Co. The new mill will be 220 by 120 feet, 4 stories and will be connected by iron bridges to mills 1 and 2, which are adjacent. The Flynt Construction Company has the contract for building the structures.

—Massachusetts, Fall River. A large addition is to be built to John H. Estes & Sons' plant.

—Massachusetts, Lowell. The Appleton Mills are building a four-story addition to their speeder room. They are also increasing their napping plant.

—Massachusetts, Lowell. Two additions are to be built by the Boott Corporation; one, three stories high, to the picker house, and the other, 308 by 24 feet, 3 stories, to the cloth room.

—Massachusetts, Shirley. An addition, 100 by 90 feet, two stories high, is now under construction to the Samson Cordage Co.'s plant.

—Massachusetts, Springfield. An addition, 42x105 feet, one story, is being made to the Springfield Webbing Co.'s plant on Mill Street, at a cost of about $4,000. Several new looms will be installed.

—*Mississippi, Wesson. The addition to Mill No. 3 has been completed and the machinery is now being installed. A new 600 h. p. engine is being put in and among other improvements is the setting up of new Saco-Pettee cards.

—*New York, Patchogue. We have been informed by the Patchogue Mfg. Co., that the finishing mill is to be torn down and replaced by a brick building, 300 by 70 feet.

—*New York, Utica. Work has been started on extensive enlargements and improvements to be made to the Utica Steam Cotton Mills. A new roof, squared, will be put on No. 2 mill, giving more space for spinning machinery; one story will be added to No. 3 mill and the picker house, which is two stories high, will be increased to five. Two of the new stories will be used for picking machinery, while the top one will be utilized for a winding room, now located in the basement. New machinery will also be installed.

—North Carolina, Charlotte. Work will be started shortly on erection of an addition for the Louise Mills, in which they will install 9000 additional spindles.

—*North Carolina, Concord. The additions to be made to the Cabarrus Cotton Mill will consist of 500 looms to be installed in a new building now under construction and 5000 more spindles, doubling present spindle capacity. They now operate 5000 spindles and 300 looms.

—*North Carolina, Gastonia. Work has been started on the addition to No. 2 mill of the Trenton Cotton Mills, the foundations now being completed. The machinery will be installed in August.

—North Carolina, Laurenberg. An addition is now under construction for the Scotland Cotton Mill, which will be equipped with 5000 spindles. It is expected to have the annex ready to begin operation about September 1st.

—*North Carolina, Lexington. Work is now progressing on the new addition to the No. 2 mill of the Wennonah Cotton Mill, and it is expected to have it completed during June.

—North Carolina, Raleigh. The Caraleigh Mills are installing 1848 new spindles and 68 new looms in the plant, giving a total of 400 looms and 10,400 spindles when complete.

—Pennsylvania, Wilkesbarre. New machines are to be installed in the Firwood Lace & Trimming Co.'s plant, of which James A. Dodd is manager. A new brick building will be erected for the additional machines, the old one then to be utilized for bleaching.

—*South Carolina, Clifton. The addition now under construction to No. 3 Mill of the Clifton Mfg. Co., will be ready for installation of the machinery about July 25th. They will install 10,000 spindles.

—South Carolina, Columbia. At the annual meeting of the Columbia Mills Company last week, it was decided to increase the spindle capacity of the plant.

—*South Carolina, Marion. It is reported that the Ashby Cotton Mills may decide to build a new mill with a capital of $100,000 instead of building an addition to the present plant. D. A. Tompkins

of Charlotte, is now considering the matter, which has been left in his charge.

—South Carolina, Spartanburg. The Tucapau Mfg. Co. is now installing 1000 additional spindles, which will give the plant a total of 27,000 when completed.

—*Tennessee, Chattanooga. The Vance Cotton Mills will be shut down for ten days, during which time $2500 worth of new machinery will be installed.

—*Tennessee, Knoxville. The new addition to the Brookside Cotton Mills will be equipped with 5000 spindles and 16 new looms, giving the plant a total of 27,000 spindles and 652 looms.

Mills Starting Up.

—*Alabama, Florence. Operations will be started June 26th, in the new plant of the Ashcroft Cotton Mills, about which we have previously reported details.

—*New Hampshire, Nashua. The new mill of the Nashua Manufacturing Company has been put in operation. Cotton blankets and spreads will be made on very wide looms. The plant has an equipment of 608 looms.

—*New York, Cohoes. Operations have been started in the plant of the Walker & Harp Mfg. So., manufacturers of cotton batting.

—*North Carolina, Concord. The No. 3 mill of the Cannon Mfg. Co. has been completed and operations begun. J. W. Cannon is secretary and treasurer of this concern.

Mills Shutting Down.

—*Millbury, Massachusetts. All the looms in the Millbury Cotton Mills are idle and the operatives are seeking employment elsewhere.

—Pennsylvania, Chester. The carding and spinning plant of the Angora Manufacturing Company has been shut down, and it is reported that the firm is going out of business.

Woolen.

New Mills.

—Connecticut, East Killingly. The old Himes Mill at Chestnut Hill has been purchased by Charles D. Chase of Elmville, Danielson, who recently sold his interest in the firm of C. D. & C. S. Chase to David Chase. The plant will be converted into a yarn mill for making woolen and merino yarns and custom spinning a specialty.

—Connecticut, Stamford. It is stated that Mason Merrill, proprietor of the Excelsior Rug Works, will build a factory for manufacturing rugs, on site now owned by Edward Bishop, on Railroad Avenue.

—Delaware, Wilmington. A plant for manufacturing fine textile fabrics is to be established here by John A. Ahrens, formerly assistant manager at the Delaware Cotton Company's mills. He has organized a stock company for purpose of operating the new plant.

—Maine, East Vassalboro. The East Vassalboro Shoddy Mill is now operated by Herbert Peace, making all-wool shoddy, with 2 cards and 2 pickers.

—*Maine, Springvale. The Maine Alpaca Company ,which purchased the plant formerly occupied by the Springvale Cotton Co., expect to have the mill, which will have an equipment of about 3000 spindles and necessary looms, in operation in a few weeks.

—Massachusetts, Barre. Francis Willey & Co., 556 Atlantic Ave., Boston, have purchased the mill village known as Crossleyville or South Barre and will establish a woolen industry on the site of the old Crossley Mill. Work will be started shortly on construction of buildings, which they contemplate having ready for operation Jan. 1st, 1901, to make worsted tops. The sale was negotiated through R. B. Denny, mill broker, 143 Federal St., Boston. This was previously reported, but denied, but we now learn the facts are as above stated.

—*New Jersey, Camden. The new plant at this place, in which George H. Craven is interested, will be known as the Colonial Rug & Textile Mills Co. Wool smyrna rugs will be made, the plant having equipment of 50 looms. Mr. Craven will be general manager of the new mill. Plant will soon be started up.

—*New Jersey, Passaic. The new plant of the Gera Woolen Mills is nearly completed.

—*New York, Binghamton. The Binghamton Felting Company has recently been incorporated with capital of $100,000. The directors are: M. J. Corbett, Binghamton; William S. Gray, New York, and Thomas Keeny, Hancock, N. H. This project has been talked of some time previous.

—New York, Falconer. A new worsted spinning mill is now being started at this place by Hines & Forbes. It will be a one-set plant.

—*New York, New York. The plant of the Persian Rug Factory, capital stock of $50,000, Robert Stuntz, president, and Giles Whiting, treasurer, is located at 167th St. and Brook Ave., a new mill having recently been completed. Persian hand made and whole chenille Axminster rugs in one piece, made especially to order, are manufactured. Plant is equipped with a dye house.

—*Pennsylvania, Tunkhannock. The Winola Worsted Company, a new spinning mill about which we have made previous mention, will equip their plant with one Noble comb and one set of drawing and spinning.

—Rhode Island, Olneyville. The National Pile Fabric Co. is a new concern recently established on Eagle St., making corduroy plushes for upholstery purposes. J. M. Taylor, formerly with the Lorraine Mills at Pawtucket, is manager of the plant. The mill is at present equipped with 30 looms, but it is expected that 50 more will be installed in the near future.

—Rhode Island, Providence. The Kingsley Worsted Co. has started up making No. 2 to 36 worsted yarns, with

1800 spindles, no combs. Dr. George A. Brug, is president; William C. Greenough, secretary, and A. H. Coleman, treasurer. Mr. Graeves is supt.

Enlargements and Improvements.

—*Connecticut, Mystic. A meeting will be held by the Mystic Mfg. Co. for purpose of increasing the capital stock and receiving a new member into the firm. It is probable that many additions and improvements will be made to the plant. Several new looms will be installed now.

—*Maryland, Oella. William J. Dickey & Sons, who now operate 60 looms on manufacture of kerseys, are to install 15 additional ones in that department.

—*Massachusetts, Blackstone. The Saranac Co. is to install 50 new looms in the plant, 30 to be installed in the main plant and 20 in the annex. It is reported that a large weave shed and other larger additions to the weaving plant may be made in the near future.

—*Massachusetts, Collinsville. The American Woolen Company, who have recently built a two-story addition to their packing room, have increased the plant from 18 to 39 sets of cards and 105 looms to 168. The number of operatives in the mill has about doubled in a year.

—*Massachusetts, East Blackstone. It is reported that Alfred Lange, who now controls the yarn mill at this place, which is run night and day, contemplates securing a larger mill in Woonsocket, owing to increase in business.

—*Massachusetts, Leominster. Nineteen Knowles looms are being installed in the Leominster Worsted Company's plant.

—Massachusetts, Plymouth. B. F. Miller, who has been connected with the New England Mills at Rockville, Conn., for 21 years as superintendent, has resigned, to take a similar position with the Standish Worsted Co., at this place, where he has purchased a half interest in the plant. The company contemplates increasing the capacity of the mill and making alterations to the plant.

—Massachusetts, Webster. Eight new looms have recently been installed in the weaving department of Josiah Perry's mill. The old boilers are also being replaced with two new ones.

—*New Hampshire, Keene. The Faulkner & Colony Mills, which we previously reported to increase the number of sets in the mill by three and addition of new looms, are also building a new picker mill, three stories high, 170 by 63 feet.

—New Jersey, Passaic. The Dundee Woolen Co. has recently installed seven new Knowles looms in the plant, giving a total now in operation of 42. They contemplate putting in a new water wheel during the summer.

—New York, Brooklyn. A new four-story brick bu...ng, 100 by 100 feet, is to be built by Joseph Wild & Co., on the present site of the frame mill at 206 Kosciusko St. Superintendent Geo. Davidson, Jr., has the matter under charge.

—*New York, Canton. R. W. Conway's carding and steam dyeing plant is being altered and repaired.

—New York, Jamestown. Large additions are being made to the Broadhead Worsted Mills, and which, when completed, will increase the capacity of the plant 25 per cent.

—*Pennsylvania, Cardington. Wolfenden, Shore & Co. are erecting two large buildings to be used as a storage warehouse and dye house respectively.

—*Pennsylvania, Clifton Heights. The machinery is now being installed in Kent Mfg. Co.'s new mill. This includes nine pairs of French worsted spinning mules and some carding machinery. The lower floor of the plant will be devoted to the sorting of wool.

—*Pennsylvania, Philadelphia. The Chester plant of the Phoenix Mills Company, has been removed to their new location at Manyunk and they are now transferring property at Tenth and Germantown Ave., Philadelphia, to the same place, where all will be combined, with a capacity of 15,000 spinning spindles and 14 combs on medium and fine yarns.

—Pennsylvania, Reading. A new weaving room is under construction for Louis Kraemer & Co.'s mill, the foundation walls having been finished.

—Rhode Island, Stillwater. The Centredale Worsted Co. are to install additional drawing, carding and combing in their branch mill at this place.

—*Rhode Island, Woonsocket. An addition, 158 by 40 feet, 2 stories, is to be built to the Dunn Worsted Co.'s mill.

Mills Starting Up.

—Connecticut, East Willington. Dennison Walker informs us that he will do nothing at Hallowell, but that he is going to start the Daleville Mill at this place, which has 2 sets 48-inch cards and 16 broad looms. The plant will be put in operation as soon as the necessary repairs are made and the necessary help, which is scarce owing to plant having been shut down for some time is secured. He is in the market for 6/4 dresser reel with beamer and stand and also a 6/4 drum cloth dryer.

—Illinois, Fairfield. The Fairfield Woolen Mills, which have been idle for some time, will be put in operation again, having recently been purchased by T. R. Jones and D. M. Walker, of Cartersville, Ga. D. M. Walker will act as resident manager and superintendent of the plant.

—*Maine, Gardiner. The Gardiner Shoddy Mill has again been sold, property now being in the hands of Wm. Harvey & Son, of Readfield, Me., who will fit it up and run to its full capacity.

—*Massachusetts, Webster. Operations have begun in the new mill recently built here by Eben Stevens, of Quinebaug, Conn.

—*Massachusetts, Worcester. Operations have resumed in the plant of the Bay State Worsted Mill, which was closed down owing to trouble with the employees.

—*Pennsylvania, Doylestown. Operations have commenced in the Doylestown Worsted Co.'s plant.

Mills Shutting Down.

—Maine, Bangor. The Penobscot Woolen Company has shut down its mill, with the exception of the finishing department, where there is sufficient work to keep running for about a week longer. It is expected that the idleness will last but a short time.

—Massachusetts, Lowell. The Middlesex Co. are running very slack and almost shut down, and it will depend on the market when they start up again.

—*Pennsylvania, Norristown. The mills of the estate of H. H. Scatchard are closed, pending the final settlement of the property. W. C. Walker, has severed his connection with the concern as superintendent. It is expected that operations will be resumed under a new firm name, after decision has been made.

—Rhode Island, Olneyville. The Riverside Worsted Mills of the American Woolen Co. will be shut down for two weeks commencing July 2d. The Washington Mills, at Lawrence, Mass., will also be closed for same length of time.

—Rhode Island, Providence. The No. 2 Mill of the American Woolen Co.'s Weybosset Mill, has been closed down for repairs. New shafting is being placed throughout the mill.

Knit.

New Mills.

—*Georgia, Warrenton. The B. L. Battle Manufacturing Company, which has recently been organized with a capital of $25,000; J. F. Allen, president; and W. F. Wilholt, treasurer, will manufacture men's and ladies' knit underwear. Plant will be equipped with 20 knitting machines, starting operations about Oct. 1.

—*Illinois, Chester. The Royal Knitting Company has been incorporated here wth a capital stock of $5000, by Percy C. Withers, Henry C. Cole and Chas. B. Cole. They will manufacture men's seamless fine gauge half hose, operating 24 machines. There will also be a separate dye house. Operations will begin about July 1st, 1900.

—Louisiana, Hammond. A proposition has been made by a knitting company now at New Orleans to locate their entire plant at this place. At a meeting recently called to order to consider the matter by the president of the board of directors of the Hammond Cotton Mill Co., F. E. Willis ,Dr. J. L. Robinson and L. Thomas were appointed to secure $16,000 toward the enterprise. If the amount is readily subscribed, work wil be started immediately on erection of the buildings for the new plant.

—*Massachusetts, Lowell. The new plant of the Hooper Knitting Company, on Rogers St., expects to begin operations in August. This is the plant recently established here with capital of $100,000, Geo. L. Hooper, president, Horace P. Beals, treasurer, and M. C. Cuttle, superintendent. Ladies' and men's full fashioned seamless hosiery will be made. They will have a separate dye house.

—Mexico, Gomez Palacio. The machinery is soon to be installed in the new knitting plant here, of which L. Goodman is to have charge. The principal stockholders are Messrs. Prince, Torres and Prince. All kinds of knitted underwear, hosiery, etc., will be made. Over $40,000 will be expended on the new enterprise.

—*New York, Johnstown. A new building, 50 by 150 feet, three stories, is to be erected by the Diana Knitting Company, a concern of which we have previously given details.

—New York, Lansingburgh. It is reported that Troy parties are interested in the organization of a company to erect a knitting mill at this place. A site has already been secured.

—*North Carolina, Columbia. We have been informed by D. Dallas Armstrong that he is trying to organize a company to develop the water power here and erect a mill for making hosiery and underwear. He is receiving estimates on all the necessary machinery for such a plant.

—*North Carolina, Durham. Work is now under way on the new hosiery mill being erected at this place and of which Julian S. Carr owns practically all of the stock. When completed, the plant will cost over $300,000, the buildings alone costing $80,000.

—North Carolina, Greenville. At a recent meeting held by the stockholders of the Greenville Knitting Mills, recently incorporated, with capital of $10,000, L. I. Moore was elected president; D. E. House, vice-president; and W. S. Atkins, secretary and treasurer. Work will start at once on construction of buildings, which they contemplate to have in operation about September 1st.

—*Ohio, Cincinnati. The new plant of the Teuton Hosiery Co., incorporated with Gustave Keller president, and Joseph M. McHugh treasurer, for manufacturing woolen hosiery, is now in operation. The plant is equipped with 20 knitting machines and two ribbers, yarns being bought. Later they expect to add manufacture of cotton and silk hosiery to the department. Goods are sold direct.

—*Ohio, Hamilton. The new knitting factory at this place, in which Peter E. Schwab is interested, is known as the Pioneer Knitting Mills. They make ladies' and children's circular ribbed underwear in silk, worsted, Egyptian and lisle. Employment will be given to about 160 girls.

—Pennsylvania, Downington. Another knitting company, known as Knowles & Co., has been formed at this place and has leased the shoe factory, where they will start work as soon as the machinery is installed. Mr. Knowles was formerly connected with the Downington Knitting Company. It is thought that operations will be started about July 1st.

—*Pennsylvania, Gordon. It is expected to have the new knitting mill, which is to be operated by William E. Johnson,

formerly of Mahonoy City, in operation July 1st. The building is 50x70 feet and will be equipped with 75 knitting machines.

—*Pennsylvania, Hazleton. Work has been started on new structure for the Hazleton Knitting Mills, in which William H. Kemp, Albert L. Dunn and Harry W. Jacobs are interested. Men's heavy underwear will be made, plant having equipment of about 15 knitting machines. They contemplate starting operations about Oct. 1st. Are in the market for everything essential for such a plant.

—*Pennsylvania, New Cumberland. The new hosiery mill at this place will be known as the New Cumberland Knitting Company, of which J. J. Baughman, is president and treasurer, and H. J. Baughman, superintendent. Men's half hose and women's and children's hosiery, 176 needle, 42 gauge, will be made. The plant, which will be equipped with 68 knitting machines, will be put in operation about Sept. 1st. Goods are to be sold through department, J. H. Conover, 464 Broome Street, New York.

—Pennsylvania, Philadelphia. A new concern operating a plant equipped with 12 knitting machines, in manufacture of 228 needle ladies' cotton hosiery, has been established at 2850 Marshall St., and is known as the Integrity Knitting Mills, Charles Klien, proprietor.

—Pennsylvania, Reading. The Active Knitting Mills, for manufacturing hosiery, have been established here by E. R. Wood, of New York.

—*Pennsylvania, Ringtown. The Ringtown Knitting Co., which has been organized at this place, with R. R. Brusch, president; H. D. Rentschler, treasurer and A. Wm. Sheeley, superintendent, will manufacture men's fine half hose, 176 needle. Plant is being equipped with 20 knitters, 4 loopers and 4 ribbers and is to be operated by steam. Expect to begin running in about a week. No selling agents chosen yet.

—*Pennsylvania, Wilkesbarre. The Morgan & Menzie Hosiery Mill, recently destroyed by fire, is to be rebuilt.

—*Pennsylvania, York. Joseph Black is president, George W. Bell, vice-president, Walter Black, secretary and Robert L. Shetter, treasurer of the new company recently located in the Wall Paper Co.'s plant. A large dye house will be built between the two paper mills. Plant is now being equipped with necessary machinery for making hosiery.

—*South Carolina, Blacksburg. Work has been started on construction of the Blacksburg Spinning and Knitting Mill, capitalized at $15,000. Cotton hosiery will be made. The plant, which will be operated by steam, will also have a dye house attached. They contemplate beginning operations during August.

—*Virginia, Norfolk. Ruffin Roles and son will be manager and superintendent respectively of the Virginia Hosiery Mill, recently organized at this place. Machinery is now being installed in the plant, which will have a capacity of 600 dozen pairs of hose daily, giving employment to 300 people.

—*Virginia, Williamsburg. Ground has been broken for foundation of the new mill to be built by the Williamsburg Knitting Mills Co., who will manufacture underwear. The main building will be 125 by 40 feet, two stories, with wing, 70 by 50 feet, one story and tower, 17 by 20 feet, three stories.

Enlargements and Improvements.

—*Illinois, Rockford. A new French system worsted spinning plant consisting of 3 Noble combs and full complement of machinery, is to be put in operation June 1st, in the Rockford Mitten & Hosiery Co.'s mill. J. W. Foster, formerly at Trenton, N. J., has been secured as superintendent.

—Massachusetts, Ipswich. A large annex is to be built by the Ipswich Mill corporation on the McDonough estate. This will be utilized, when completed, for manufacturing yarns.

—*Massachusetts, Springfield. Two large additions are to be made to the plant of the Springfield Knitting Company. One to No. 1 mill will be 105 by 51 feet and the other, which will join mills No. 1 and 3, will be 20 by 34 feet. The larger addition will be used for accommodation of one whole department of the knitting business.

—New York, Hoosick Falls. A bleach house is now being erected for the Hoosick Falls Hosiery Company on their property near the mill.

—*North Carolina, Durham. We have been informed by the Durham Hosiery Mills, of which J. S. Manning, is now president; J. S. Carr, Jr., treasurer and R. W. Lewis, superintendent, that they expect to have the new yarn mill in operation February 1st, 1901. The capital stock has been increased to $500,000.

—*North Carolina, Kinston. The Orion Knitting Mills will issue $4000 worth of additional stock for purpose of erecting a dye house.

—Pennsylvania, Hummelstown. The addition to the Keystine Knitting Mills, of which Ulrich & Knull are proprietors, will be equipped with 28 knitting machines, giving the plant a total of 52.

—*Pennsylvania, Reading. The Pennsylvania Knitting Mills, which recently removed to larger quarters at Maple Street, propose erecting a dye house and box factory, not only for product of its own plant, but also a number of others. The buildings will be three stories high. In the new location the mill will have a capacity of 2500 dozen pairs of hosiery per day.

—*Rhode Island, Woonsocket. The Woonsocket Knitting Company, now at rear of 123 Main Street, inform us that they will occupy the Bartlett Mill, corner Main and Bernon Streets, about July 1st. They are now erecting a dyehouse on the new premises. They will install 50 additional knitting machines in new location, giving the plant a total of 60, when set up.

Mills Starting Up.

—*New York, Rome. Operations have been started in the new underwear mill established here by William J. Carroll. All of the machinery has not been installed, but it is put in operation as soon as possible after arriving.

—*North Carolina, Scotland Neck. Operations have begun in the knitting mill established here by Edward Shield. The plant manufactures cotton hosiery, giving employment to about 40 people.

—*Pennsylvania, Downington. Operations have been started in Evans & Walker Hosiery Co.'s plant, recently rebuilt. Twelve machines are now in operation and they expect to have 20 more ready to start work in about a week.

—Rhode Island, Woonsocket. Operations will be started about the last of the month in Mason & Hubbard's knitting mill. As soon as the company receives the winders for the plant, the building will be completed.

Mills Shutting Down.

—New York, Albany. The large knitting mill, owned and operated by Fuld & Hatch, has been shut down. It is expected that the difficulties with the help, regarding the new system of work, will be speedily adjusted and not much time lost.

Silk.

New Mills.

—*Maine, Westbrook. Work is now progressing on the new mil for the Haskell Silk Co. Two large boilers will be installed in the dry house, which will be 45 by 107 feet, and upon which they have also begun construction.

—*Massachusetts, Milford. The Magid-Hope Silk Co., Louis B. Magid, president, opened their new offices at this place June 1st, being previously located in Boston. Warren M. Hill is treasurer and Mr. S. Rheinberg the secretary, has charge of the general sales and foreign importing department. The works are well under way and will soon be ready to start operations.

—*New Jersey, Haledon. The Mountain Silk Company, which occupies the mills recently sold by William Wicke, have installed new machinery and looms in the plant and will start operations shortly manufacturing broad silks. As previously reported, most of the product will be used by Mr. Weil, manufacturer of silk waists.

—New Jersey, Paterson. Zach. Cole has started a commission silk throwing plant in the Hamilton Mill, on Mill Street.

—*Pennsylvania, Bradford. The foundation of the new silk mill is nearly completed and work will be pushed to finish structure as soon as possible. This is the plant to be occupied by Henry Leon, of Paterson, N. J.

—*Pennsylvania, Carbondale. The new mill now under construction at this place, and which is a branch of the Empire Silk Works, of Paterson, N. J., will be operated under name of the Empire Silk Manufacturing Company. The incorporators are: John L. Willie, of New York; William Burton of Goodwin, N. Y. and Lloyd Garrison, of West Orange, N. J. The office will be located at Paterson.

—Pennsylvania, Dengler's. It is reported that Jacob W. Miller and John Fulmer of North Wales are interested in the erection of a silk mill at this place.

—*Pennsylvania, Hazelton. The machinery is now being installed in the Duplan Silk Co.'s new plant at this place, about details have been previously given.

—*Pennsylvania, So. Bethlehem. The new silk mill, now under construction at this place for Geo. W. Grube, will be 48 by 100 feet, one story high, with basement. It is expected that the plant will be in operation by Sept. 15th.

—Rhode Island, Valley Falls. Messrs. David, Reiling & Schoen, of Hoboken, N. J., will establish a large silk manufacturing plant at this place. Four buildings, of which the largest will be a weave shed, 200 by 250 feet, 2 stories and one story, will be erected. There will also be a spinning mill, 50 by 158 feet, a dye house and a power house. Employment will be given to about 250 people. The Albion Company donated the land, amounting to 95,000 feet. Mr. Pierce, formerly superintendent of the Lonsdale Company at Ashton, R. I., will be superintendent.

—*Virginia, Suffolk. A recent report states that the project of erecting a new silk mill has been abandoned, as no progress has been made regarding the matter. This refers to the Nansemond Silk Company, incorporated some time ago.

Enlargements and Improvements.

—Massachusetts, Sandwich. It is reported that an addition is to be built to the Union Braiding Co.'s plant.

—*Pennsylvania, Catasaqua. New machinery is being installed daily in the Dery Silk Mill, which recently completed a large addition to the plant.

—*Pennsylvania, Shamokin. The Shamokin Silk Mills inform us that they have not yet determined the size of the addition to be built nor number of looms to be installed.

Miscellaneous.

New Mills.

—Alabama, Birmingham. The Pratt Bag Company has been formed by John and J. H. Pratt, who will lease a building for manufacturing bags. It is reported that the orders for machinery have already been placed.

—*California, Oakland. The California Flax Mills, incorporated with a capital of $200,000 recently, will manufacture thread and twine. John Rutherford will be manager. A dye house will be attached. Operations will be started in about a month.

—*Georgia, Augusta. The Clear Water Bleachery and Manufacturing Company has been organized and Thomas Barrett, Jr., elected president and treasurer of the concern. The directors are: Charles Estes, Norman Schultz, H. B. Vaughan, F. B. Pope, W. J. Craig and Thomas Barrett. It is reported that contracts are to be let shortly and work started on construction of the plant. This project has been agitated for a long time and it seems now as if something was to be done.

—Maryland, Cumberland. A three-story addition, 35 by 85 feet, is now under construction for Thomas Footer & Sons, to their dyeing and dry cleaning plant.

—Maryland, Hagerstown. S. Milford Schindel and Martin L. Main have started a plant for mercerizing cotton, with capacity of 700 lbs. per week.

—New Jersey, Paterson. The Eclipse Manufacturing Company has been incorporated with capital stock of $50,000, to manufacture and sell flax, hemp and jute products. Alfred R. Turner, Jr., Frank Gledhill, W. D. Blauvelt, Henry H. Parmalee and Vivian M. Lewis are the incorporators.

—Pennsylvania, Philadelphia. The Empire Flax Mills, southwest corner of Unity and Elizabeth Streets, are now operated by the Aransea Mfg. Co., making flax, twines, threads and yarns. The plant is equipped with a dye house.

—Pennsylvania, Philadelphia. Benjamin Race is president and Samuel Corkran, treasurer, of the Manchester Finishing Works, recently incorporated with capital of $25,000. The company will make a specialty of job finishing of linen, cotton, silk and woolen dress goods and cotton men's wear in wet and dry. Later the plant will be equipped for bleaching.

—Rhode Island, Providence. Leonard Hollingworth is now manager of the Providence Finishing Works, recently established for manufacturing clays and medium weight serges. The mill is equipped with 20 broad looms, and also a complete piece dyeing and finishing plant.

—Rhode Island, Slatersville. We learn that the Slater Mill property, which was under option by the National Flax Fibre Co., but who did not complete the purchase, has been sold to a company who will immediately install necessary machinery, converting it into a large bleachery. D. M. Savory, who has for some years past been agent of the Great Falls Bleachery, will be the manager of the plant, and associated with him, Mr. James S. Hooper, formerly of Minot, Hooper & Co., and two of the Lawrences of Boston. Every effort will be made to get the plant into production as soon as possible.

Enlargements and Improvements.

—New York, Brooklyn. The new building under construction for the Chelsea Jute Mills, at Manhattan Ave. and Commercial St., will give an additional floor space of 9000 square feet.

—New York, Utica. The Utica Dyeing Company, of which F. W. Brown is president, R. B. Billings, treasurer and R. F. Moore, superintendent, is negotiating for the purchase of the old steam woolen mill property on Columbia Street. This is owing to the great increase in business which necessitates the company seeking larger space.

—Pennsylvania, Philadelphia. The Schlichter Jute Cordage Works have let contract for erection of a large three-story building, 226 by 90 feet, to be erected on Amber St., corner Erie and Trenton Aves.

Mills Shutting Down.

—Rhode Island, Apponaug. The Apponaug Print Works have been shut down, on account of delay in receiving a large consignment of cloth.

Fires.

—Indiana, Richmond. The woolen mill operated by J. W. Test & Co. has been destroyed by fire, machinery and stock being ruined. The loss is estimated at $10,000, with insurance of $5000. It is quite probable that the mill will be rebuilt.

—Massachusetts, Mendon. The shoddy mill at this place, operated by Mrs. H. S. Swann, was totally destroyed by fire. The loss is $6000, with no insurance.

—New Jersey, Pompton Lakes. The Bryne Brothers' Bleachery, building of which was owned by H. J. Smith, was destroyed by fire, causing loss of $50,000-part of which is covered by insurance. It is reported that the plant will be rebuilt at once.

—New York, Amsterdam. The carding department of Van Brocklin & Stover's underwear mill was damaged by fire recently. The loss is estimated at about $10,000.

—New York, Middleville. The plant of the Nelson Knitting Co., at this place, was badly damaged by fire, causing a loss of about $15,000, mostly in the printing, dyeing and picking departments. The loss is fully covered by insurance on both the building and stock.

—New York, Newburgh. Crabtree & Patchett's mill was damaged recently by fire to the extent of $5000.

—Pennsylvania, McAlvey's Fort. The woolen mill, operated by the Gibboney Bros., has been totally destroyed by fire, with loss of about $20,000, carrying insurance of $2000.

—Pennsylvania, Philadelphia. C. H. Masland & Son's extensive carpet mills, at Amber and Willard Sts., were badly damaged by fire. The loss on buildings, machinery and stock has not yet been fully estimated, but it is reported that it is covered by insurance.

—Pennsylvania, Philadelphia. Fire in the stock warehouse of W. D. Whitaker, adjoining the cotton yarn mills, located at Emerald & Westmoreland Sts., caused a loss to stock and building of about $5000.

—Pennsylvania, Philadelphia. The machinery of the plants operated by William Johnston, William Somerset and I. H. Kerkeslager in the Keystone Mills, was damaged by fire recently to the extent of about $2000.

—Pennsylvania, Philadelphia. Thos. Boggs and Son's carpet mills, Second St. and Allegheny Ave., have been damaged by fire to the extent of about $50,000. The loss is fully covered by insurance.

PERSONAL RECORD.

Knit.

—Francis J. Cartledge, of South Boston, Mass., recently left for York, Pa., to accept the superintendency of the York Knitting Mills.

—Frederick Karg, superintendent of the Kalamazoo Knitting Co., Milwaukee, Wis., has resigned, and returned to his former home in Johnstown, N. Y.

—Fred Lee, formerly boss carder at the Halcyon Mills, Cohoes, N. Y., now is in charge of the carding of the New England Knitting Co., Winsted, Conn., taking Edward Lassure's place.

—Walter P. McQuillen, late superintendent for John E. Hanifen & Co., Philadelphia, Pa., has recently accepted a position in a large mill in the South.

—George Martin has succeeded Edward Hurley as secondhand in the knitting room of the Rockwood Knitting Mills, Bennington, Vt.

—Irving Miller, superintendent of the Valatie (N. Y.) Knitting Mills, has resigned, and been succeeded by Mr. Pitcher of Hudson, N. Y.

—John A. Crossland has recently accepted charge of the new yarn mill of the Elmira Knitting Mills, Elmira Heights, N. Y.

—George McKenzie, formerly boss dyer at the Slater Mills, Slatersville, R. I., has accepted a similar position with the Jenckes Mfg. Co. of Pawtucket.

—Charles Ostron has recently secured the position of overseer of knitting at the Superior Knitting Mills, Hoosic Falls, N. Y.

—Fred Perrine, formerly employed at the Himes Underwear Co.'s mill in Cohoes, N. Y., has accepted a position in the Victor Knitting Mills, Cohoes.

—William Shaughnessey has recently been engaged as secondhand in the card room of the Halcyon Mills, Cohoes, N. Y.

—Francis Van Allen, lately with the Little Falls (N. Y.) Knitting Co., is now boss spinner in the Rockton Mills at Little Falls.

—Lewis White, of Providence, R. I., has engaged with Samuel Rowland, Schuylkill Haven, Pa., as foreman dyer and bleacher.

Cotton.

—Robert Boys of St. John, N. B., has gone to Williamstown, Mass., as overseer of the weaving department of the Williamstown Mfg. Co.

—J. H. Barnwell, late boss spinner at the Nottingham Mill, Providence, R. I., has secured a position in Valley Falls, R. I.

—Joseph Brierley is meeting with much success at May's Landing, N. J., now having charge of both carding and spinning there.

—J. T. Collins has resigned as boss spinner at the Shetucket Mill, Norwich, Conn.

—Thomas H. Conley of Ware, Mass., has resigned his position of overseer of mule spinning to accept the position of superintendent for the Standard Cotton Mills of Cedartown, Ga.

—Haywood Dennis has changed from the weaving department of the Odell Mills, Concord, N. C., to the spinning department of the same mills.

—Albert W. Danforth of Lowell, and formerly a mill agent in Newburyport, has charge of a large cotton mill plant near Shanghai, China. Mr. Danforth has been in China 18 years.

—J. M. Fisher, late of the Hamilton Mills, Lowell, Mass., is now overseer of weaving in the Maginnis Cotton Mills, New Orleans, La.

—John Fernley, overseer of weaving and late of Williamstown, Mass., is now in charge of the weaving in the No. 6 mill at the Boott Cotton Mills, Lowell, Mass.

—George Fish, formerly overseer in No. 1 mill weaving room of the Massachusetts Cotton Mill, Lowell, has resigned to accept the superintendency of the Centreville, R. I., Cotton Mill.

—John W. Gray, for the pay 10 years overseer of weaving for the Hooksett Mfg. Co., Hooksett, N. H., has severed his connection with that concern.

—William Gillespie has recently accepted the position of assistant superintendent of the Hampton Co.'s mill at East Hampton, Mass.

—B. N. Hale, recently overseer of carding at the Glenalian Mills, Winchendon, Mass., is now secondhand at the Boott Mills, Lowell, Mass.

—J. B. Harkey, overseer of spinning at the Eufaula Mill, Eufaula, Ala., has resigned and is succeeded by W. F. McLendon.

—William P. Holt, formerly agent of the William Slater Corporation at Slatersville, R. I., has gone to Wilmington, Del., to superintend one of the largest mills in the state.

—Freeman Higgins, superintendent of the mechanical department of the Amoskeag Mfg. Co., Manchester, N. H., after more than 40 years of faithful service in the employ of the company, has severed his connection with it. He is one of the best known men in Manchester. His resignation took effect on July 1st.

—William Howarth, for several years overseer in charge of the weaving department at the Interlaken Mill, Arkwright, R. I., has been promoted to a more responsible position at the mill in Harris recently acquired by his employers. Supt. Andrews, on behalf of the weave room employes, presented him with a handsome couch.

—W. T. Hurley has been appointed superintendent of the new mill at Sanford, N. C.

—F. Hamilton, formerly with the Poe Mill, Greenville, S. C., is now superintendent of the Darlington Mill, Darlington, S. C.

—John Kerr is overseer of the starching and packing rooms at the Hamilton Mills, Lowell, Mass.

—Martin Kelley, formerly secondhand of carding at the Union Mills, Fall River, Mass., has accepted charge of the carding department of a large Pennsylvania mill.

—R. C. Kies, superintendent of the Farnumsville Cotton Mills, Farnumsville, Mass., has resigned to accept the superintendency of a large cotton mill in Valatie, N. Y.

—Thomas F. Kennedy, for the past year in charge of the spinning department at the Farnumsville Cotton Mills, Farnumsville, Mass., has succeeded R. C. Kies as assistant superintendent in that place.

—J. F. Lewis, superintendent of the Hucomuga Mills, Greensboro, N. C., has resigned to accept a like position with the Leaksville Cotton Mills of Spray, N. C.

—Walter S. Lawson, superintendent of the Great Falls Bleachery, Somersworth, N. H., has been appointed agent to fill the vacancy caused by the resignation of David W. Savory.

—John J. McOsker, boss carder, has resigned his position at Slatersville, R. I., and accepted a similar position at Millville, N. J.

—C. L. Montjoy has changed from overseer of spinning, spooling, warping, and slashing at the Laurens Mill, Laurens, S. C., to a similar position at the Enoree Mills, Enoree, S. C. C. J. Trippe, formerly secondhand of spinning at the Laurens Mill, has been promoted to the position of overseer to take Mr. Montjoy's place.

—J. C. Moore, assistant overseer of spinning at the Henrietta Mill No. 2, Caroleen, N. C., has tendered his resignation in order to accept the position of overseer of spinning at the Anderson, S. C., Orr Mill.

—Edward Noonan, formerly overseer of ring spinning, spooling, warping and dressing at the Pierce Mill, New Bedford, is now superintendent of the Nos. 1 and 2 mills of the Bennett Spinning Co. at New Bedford, Mass. Mr. Noonan was with the Pierce Mill since it started, about eight years ago, and his resignation was much regretted by the management. The help under Mr. Noonan presented him with a gold watch as a token of esteem, upon his departure.

—J. E. Nuttall, until recently with the King Philip Mill at Fall River, Mass., is overseer of dressing room at the Boott Mill, Lowell.

—H. Pilkington, recently overseer of carding for the Millville Mfg. Co., Millville, N. J., is now engaged with the Tremont & Suffolk Mills, Lowell, Mass.

—Harry Page has resigned as overseer of the finishing room at the Lancaster Mills, Clinton, Mass.

—I. T. Prosser has resigned as boss weaver in the Boston Duck Co.'s mill at Bondsville, Mass., and is succeeded by John Green.

—J. S. Pye, until recently overseer of weaving at the Willimantic Cotton Mills, Willimantic, Conn., has been promoted to take the superintendency of the mill. W. Varley, of the Osborn Mill, Fall River, Mass., has been appointed to Mr. Pye's former position.

—Edward Quigley, loom fixer at the Gloucester Cotton Mills, Gloucester City, N. J., for some years, has been promoted to the position of overseer of weaving at the mills.

—Charles Rogers is now overseer of mule spinning with the Otis Mfg. Co., Ware, Mass.

—J. K. Russell, for many years general manager at May's Landing, N. J., resigned his position July 1st, being succeeded by A. W. Brainerd, formerly general superintendent of B. B. & R. Knight's mill, Providence, and for the past few months superintendent at the Tremont & Suffolk Mills, Lowell, Mass.

—J. J. Rogers has been obliged to resign as overseer of weaving at the F. W. Poe Mfg. Co.'s mills, Greenville, S. C., on account of ill health.

—John Riley, for a number of years overseer of ring spinning at the Howland Mill, New Bedford, has gone to the Pierce Mill, same place, to the position of overseer of ring spinning, spooling, warping and dressing, made vacant by the resignation of Edward Noonan.

Woolen.

—Louis A. Anderson, formerly superintendent of the Skowhegan, Me., mill of the American Woolen Co., has been appointed agent of the Fairfield, Me., mill.

—Thomas E. Ainley, of Amsterdam, N. Y., has recently accepted the position of boss carder at the mill of the Chapel Mills Mfg. Co., Cherry Valley, Mass., and entered upon his new duties.

—C. N. Bagley, overseer of weaving at Belvidere No. 2 Mill, Lowell, Mass., has tendered his resignation, to take effect July 1st. Mr. Bagley goes at once to Linares, Mexico, to take full charge of a new mill. The mill will have one set of 60-inch cards, with accompanying machinery, and will manufacture blankets.

—Charles Bragg, recently superintendent for the American Woolen Co.'s mill at Moosup, Conn., has just engaged with the Warren Woolen Co., Stafford Springs, Conn., in a similar capacity, succeeding Richard A. Rice, who has resigned.

—James W. Bentley has been engaged as superintendent of the Standish Worsted Co.'s mill in Plymouth, Mass. Frank E. Anderson has recently sold a half interest in this company to Benjamin F. Mellor, who has been for many years superintendent of the New England Mills, Rockville, Conn.

—J. G. Burnes, for the past five years employed as overseer of spinning by the

Burlington Woolen Co., Winooski, Vt., has resigned in order to accept the position of carder and spinner for the Mascoma Mills of the American Woolen Co. at Lebanon, N. H., under Resident Agent George E. Whitney. Mr. Burnes was formerly with the National & Providence Worsted Mills in Providence, R. I.

—Daniel M. Brown, for nine years superintendent of Kimball's mill at Manton, R. I., has severed his connection with that establishment, and will hereafter act in a similar capacity at his own mill in Hampden, Mass. The employes of the mill presented him with a diamond ring.

—Thomas F. Brennan of Walnut Hill, Mass., has been engaged as overseer of carding by the Dayville Woolen Co., Killingly, Conn. Mr. Brennan is a well-known mill man, and president of the National Association of Woolen and Worsted Overseers.

—Charles E. Chase, formerly with Chase Brothers, Elmville, Conn., will in future operate the mill at Chestnut Hill, Conn., in the manufacture of woolen yarns for the direct market. This mill, until recently, was operated by the Chase Brothers.

—Howard P. Chase, assistant superintendent at the Mohegan Mill, Burrillville, R. I., for two years past, has resigned, and William P. Nichols, of Oakland, R. I., has succeeded him.

—Hugh Clayton, superintendent of the Provo Woolen Mills Co., Provo City, Utah, has been made assistant to General Manager Reed Smoot.

—Thomas F. Copewell, Providence, R. I., is overseer of the dye room at the Springvale (Me.) Woolen Co.'s mill.

—James J. Donlan, overseer of carding and lately of the William Wood Woolen Co., Philadelphia, has engaged with the Clinton Mills Co., Norwich, Conn.

--John J. Deavitt, recently overseer of weaving at the Faulkner and Colony Mills, Keene, N. H., is now with the Talbot Mills, North Billerica, in a similar capacity. His successor at Keene is A. P. Taplin.

—F. J. Demars, overseer of dyeing in the George's River Mills, Warren, Me., has given up his position and will take a much needed rest.

—Harry Gill, late boss dyer for the Winooski Worsted Co., Winooski, Vt., and previously with M. T. Stevens & Co., Andover, Mass., is the new boss dyer for the Saxonville Mills, Saxonville, Mass.

—Walter Green, foreman finisher for Chase Bros., Danielson, Conn., has resigned and engaged with Davis & Brown of the same place.

—Harry G. Greaves has resigned his position with Milner & Co., Moosup, Conn., in charge of the spooling and reeling departments, and has accepted a position in Providence.

—J. G. Gormley, boss dresser for the American Woolen Co., at Manton, R. I., has been promoted to the position of superintendent of the mill, to take the place of D. N. Brown, who has resigned.

—Joseph Glennon, boss fuller, and William Welch, cloth inspector, at Collinsville, Mass., have resigned, and Mr. Welch has accepted a similar position at Stafford Springs, Conn.

—Leonard Hollingsworth, for a number of years boss finisher at the National & Providence Worsted Mills, Providence, R. I., is now manager of the Providence Finishing Works.

—F. Haggis has taken J. C. Baldwin's place as boss spinner at the National & Providence Worsted Mills, Providence, R. I.

—George W. Hall, boss carder, has recently resigned his position with the Brookville Woolen Mills, Lenni Mills, Pa. For a number of years he was in business for himself as job carder, at Chester, Pa.

—James Hardy, overseer of carding at the Dayville Woolen Co., Killingly, Conn., has resigned and gone to the Aetna Mills, Watertown, Mass.

—George Judson, lately overseer of finishing for the Merrimac Woolen Co., Lowell, Mass., is now in Robert Bleakie Co.'s mill in Hyde Park, Mass.

—A. E. Jones, overseer of wool carding, and for many years a resident at Webster, Mass., has removed his family to Putnam, Conn., where he is now employed by the Putnam Woolen Co.

—P. J. Keenan overseer of carding and spinning at Shewville, Conn., has resigned to accept a similar position with Eben Stevens at Webster, Mass.

—D. C. Leboron, formerly in charge of the weaving for the Mayo Woolen Co., Millbury, Mass., has moved to Brooklyn.

—W. G. Loveland, late of Huntington, Mass., has accepted charge of carding at the Milner Mill, Mossup, Conn.

—James E. Milner, at one time boss finisher with the Conshocken (Pa.) Woolen Co., and later with the Stafford Springs Woolen Co., Conn., for two years, has accepted a position with the Amsterdam (N. Y.) Woolen Co.

—J. Mack is now boss weaver at the Lippitt Woolen Mills, Woonsocket, R. I., in place of A. Taplin, resigned.

—James Machrie recently started work in his new position as boss dyer for the Amsterdam (N. Y.) Woolen Co.

—J. S. Murr, late of Fredericksburg, Va., has accepted charge of the looms at S. K. Wilson's Mill at Trenton, N. J., and also does the designing.

—A. C. Mackey, overseer of the filling department at the Bowden Felt Mills, Millbury, Mass., has resigned. He had been in the employ of the company since its incorporation.

—Henry Merritt, designer for the American Woolen Co., at Webster, Mass., will sail with his family for England on July 3rd, and spend the summer among his relatives there.

—Patrick Moore, for the past few months boss dyer for Davis & Brown, Danielson, Conn., terminated his connection with that firm June 16th.

—John McCawley, who for a long term of years has been in the employ of the Lawrence Keegan Woolen Co., Wilsonville, Conn., as overseer of finishing, has resigned, and engaged with the American Woolen Co., Skowhegan, Me.

—Charles L. Perry, of Philadelphia, has engaged with the Dayville Woolen Co., in an official capacity.

—George Pettengill, of Bound Brook, N. J., has been engaged as boss finisher for the Oneko Woolen Mills, New Bedford, Mass.

Miscellaneous.

—Henry Straus, senior member of the firm of Straus & Co., manufacturers of Boilerine, will sail for Europe June 30th, to take charge of their exhibit in Paris.

—William E. Stowe, senior partner of Messrs. Whitney, Pousland & Co., the old established and wealthy firm of bankers and merchants, Boston, at a recent meeting of the directors of the Magid-Hope Silk Mfg. Co., of Milford, Mass., was elected treasurer, succeeding Warren M. Hill, resigned.

—E. L. England, formerly of Rochdale, Mass., has secured the position of boss weaver with the Butler Silk Mill, Butler, Pa., starting work July 1st.

Deaths.

—John N. Hazard of Peacedale, R. I., died last month, in his sixty-fourth year. At the time of his death he was a director of the Peacedale Mfg. Co., and for twenty-six years previous to 1892 was its president.

—Ellis Earnshaw, for 17 years superintendent of the Fisher Mfg. Co.'s mill, Fisherville, Mass., died June 13th, after a short illness. Mr. Earnshaw was born in England 52 years ago and came to this country in 1873. He worked in Philadelphia and then in Manville, R. I., and from there went to Fisherville to accept the superintendency of the Fisher mill, and since the death of G. W. Fisher last February, he has had practically charge of the whole business. Mr. Earnshaw was also an inventor, some of his inventions now being used on the Crompton looms. Besides a wife, he leaves three sons, Walter H., of Fisherville, Charles H., a student at Worcester Tech., and George A., a student at Worcester Academy.

—John Worthington Dickinson, Jr., superintendent of the Lyman Mills, Holyoke, Mass., died at the Holyoke City Hospital, of pneumonia, recently. Immediately after graduating from Harvard University, in the class of 1884, he entered the Lyman Mills, working his way up, through successive stages, until he had reached the position of superintendent.

—Thomas Henry, Sr., Philadelphia, died at his home recently from paralysis of the brain, which resulted from injuries received from an accident some weeks previous, being knocked down by a wagon. Mr. Henry was born at Bolton, England, in 1824, and came to this country in 1850, locating at the Falls of Schuylkill, where he obtained employment as a laborer in William Simpson's Washington Print Works, of which he eventually became manager. He filled the positions of foreman of a print works at Gloucester and salesman for his brother, a manufacturer of cloth, and then engaged, with his father, in the cotton and cotton waste business. After taking his sons, Thomas, Jr., and William S. into partnership, the firm added the manfacture of cotton hosiery yarns at Carrol and Taylor Sts. When the mill was destroyed by fire the firm purchased the present property at Trenton Ave. and Tioga St., where the increasing business necessitated the erection of three large buildings. Three sons and three daughters and a number of grandchildren suvive him.

—Augustus Lowell died at his home in Brookline, Mass., on June 22nd. Mr. Lowell for many years was the treasurer of the Boott Mills and the Merrimac Mfg. Co. At one time he was president of the Board of Directors of the Massachusetts Cotton Mills and the Lowell Machine Shop and a director of the Lowell Mfg. Co. Mr. Lowell graduated from Harvard University in 1850. He was vice president of the American Academy of Arts & Sciences, a member of the Massachusetts Historical Society, and the sole director of the Lowell Institute.

—Joseph Porter Battles died at North Andover, Mass., June 23rd. He was 78 years old. Mr. Battles was born in Dorchester, Mass., and was educated in the Dorchester and Lowell public schools. Early in life he worked in the Boston office of the Tremont & Suffolk Mills. In 1850 he went to Lawrence as paymaster of the Atlantic Mills, and afterwards succeeded Gen. K. Oliver as agent. He was connected with the Atlantic Mills for over 37 years. Five children survive him.

—Lyman T. Goff, son of Col. L. B. Goff, one of the leading citizens and manufacturers of Pawtucket, R. I., died last month. He was born in Pawtucket 32 years ago, and was treasurer of the corporation of D. Goff & Sons, a director of the American Textile Co. and the Bridge Mill Power Co.

—Edmund Dwight, one of Boston's oldest and most successful residents, died June 6th. He was born in Boston 76 years ago, and was graduated from Harvard College in 1844. Until three years ago he held the office of treasurer of the Stark Mills of Manchester, N. H., and at the time of his death was president of the Board of Trustees of the Massachusetts General Hospital. Just after the Franco-Prussian War he acted as agent for the distribution in France of funds collected in Boston for the relief of sufferers from the war. He retired from business three years ago.

—Hugh Whiteley, senior member of the firm of H. Whiteley & Co., yarn manufacturers, died suddenly last month, at his office in the Good Intent Mills, Philadelphia, of heart disease. Mr. Whitely came to this country from England when 17 years old. With his five brothers as partners he began the manufacture of yarn before the Civil War, and continued successfully until its close, and in about the year 1878 he started again, as senior member of the present firm of H. Whiteley & Co.

—Orville D. Bryant, for 20 years an overseer in the Laconia Mills, Biddeford, Me., died June 4th, in his 70th year.

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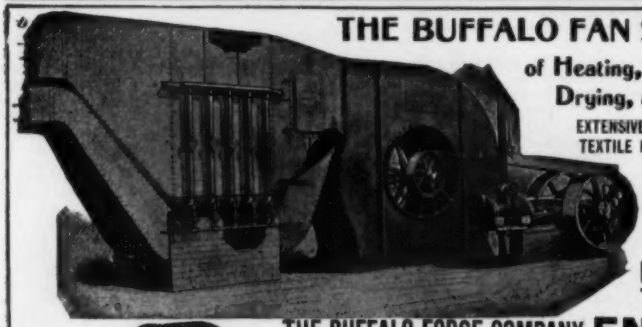

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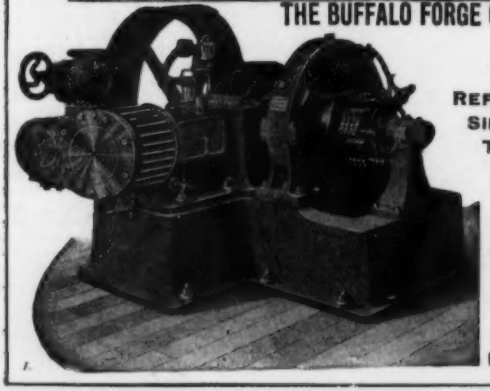

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New York. Cleveland. Chicago.

BUYERS' INDEX.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

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Air Moistening System.
American Moistening Co., 150 Devonshire St., Boston.

Arc Lamps.
Lea Manufacturing Co., Elwood, Indiana.

Architects and Mill Engineers.
Berlin Iron Bridge Co. The, East Berlin, Ct.
Ferguson, John W., Paterson, N. J.
Tower & Wallace, Broadway and 25th St., New York, N. Y.

Artificial Stone.
Warren Bros. Co., 143 Federal St., Boston.

Asphalting & Asphalt Materials.
Warren Bros. Co , 143 Federal St., Boston.

Asphalt Roofing.
Warren Bros. Co. 143 Federal St., Boston.

Automatic Feeds for Cotton and Wool.
Atlas Foundry & Mch. Co., Newark, N. J.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Bailing Machine.
Torrance Mfg. Co, 18 Davis St, E. Newark, N. J.

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Belt Cover.
Warren Mfg. Co., Chicago, Ill.

Belting.
Alexander Bros., 410 No. 3d St., Phila., Pa.
Boston Belting Co., Boston, Mass.
Hammer, C. H. & Co., Philadelphia.
Jeffrey Manufacturing Co., Columbus, Ohio.
Link Belt Machinery Co., Chicago, Ill.
Popham, Henry, & Son, Newark, New Jersey.
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Belt Dressing.
Alexander Bros, 410 No. 3d St, Phila, Pa.
Cling Surface Co., 168 Virginia St., Buffalo, N. Y.
Stephenson Mfg. Co., Albany, N. Y.
Warren Mfg. Co., Chicago, Ill.

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Bristols Co., Waterbury, Ct.

Bindings.
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Bleaching Materials.
Bosson & Lane, Boston.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Blowers.
American Blower Co., Detroit, Mich.
Buffalo Forge Co., Buffalo, N. Y.
New York Blower Co., New York.
Sturtevant, B. F. Co., Boston, Mass.

Bobbins, Spools, Shuttles, Etc.
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Parker, Henry Co, Springfield, Vt.
Tebbets, E. L., & Co., Locke's Mill, Me.

Boiler Compounds.
Straus & Co., 59 Broad St., New York.

Boiler Tube Cleaners.
Coggeshall Mfg. Co., 120 1-2 Liberty St., New York.

Boxes, Cloth Boards, Etc.
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Braiding Machinery.
New England Butt Co. Providence, R. I.
Thun & Janssen, Reading, Pa.

Braids.
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Bridges.
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Brushes.
Felton, S. A. & Son Co., Manchester, N. H.

Brushers.
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Taunton-New Bedford Copper Co., New Bedford, Mass.
Rusden Machine Co., Warren, R. I.
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Card Clothing.
Ashworth, Elijah, Fall River, Mass.
Booth, Benj. & Co., Philadelphia.
Buck Card Clothing Co., Palmer, Mass.
Hammer, C. H. & Co., Philadelphia.
Leigh, Evan A, 35 Mason Building, Boston.

Card Grinding Machinery.
Hardy Machine Co., Biddeford, Me.
Roy, B. S. & Son, Worcester, Mass.

Carders' Tools.
Brown, W. H, Mechanic St, Worcester Mass.

Carpet Machinery.
Altemus, W. W, & Son, 2816 N. 4th St, Phila, Pa.
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Furbush, M. A, & Son, Machine Co, Phila, Pa.
Granger Foundry & Machine Co., Providence, R. I.
Howard, Geo. C., 1788 Barker St., Phila., Pa.

Cement "Dealers."
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Chemicals and Apparatus.
Bullock & Crenshaw, 528 Arch St, Phila, Pa.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Clutches.
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Eastern Machinery Co., The, New Haven, Conn.
Hunter, James, Machine Co., North Adams, Mass.

Combs (Wool and Cotton).
Crabb, William, & Co, Newark, N. J.
Townsend, Thomas, 157 Orange St., Providence, R. I.

Commission Merchants (Dry Goods, Knit Goods).
Hirschman, H. 419 Broome St., New York.

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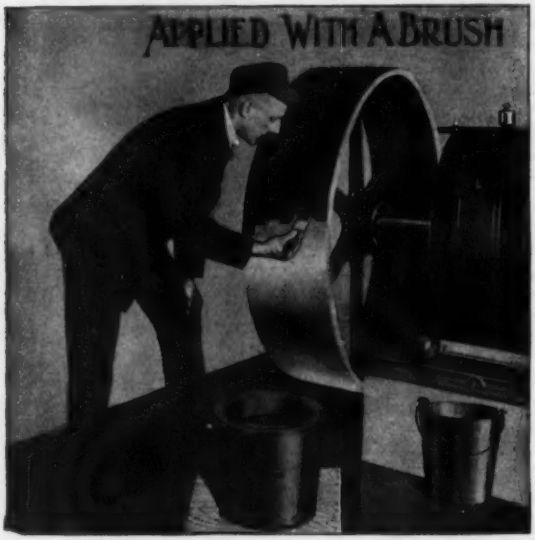
Warren Bros. Co., 143 Federal St , Boston.

Conveying Machinery and Chains.
Jeffrey Manufacturing Co., Columbus, O.
Link Belt Machines Co., Chicago, Ill.

Copper (Perforated.)
See under Perforated Metal.

Warren's Pulley Cover



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Copper Print Rollers.
Phillips Co, The Thomas, Providence, R. I.
Taunton-New Bedford Copper Co., New Bedford, Mass.

Copper Work for Dyers.
Butterworth, H. W. & Sons Co., Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Phillips Co, The Thomas, Providence, R. I.

Corrugated Iron Shutters.
American Bridge Co., New York.

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Cotton Elevators.
Buffalo Forge Co., Buffalo, N. Y.
Link Belt Machines Co., Chicago Ill.

Cotton Machinery.
Altemus, W. W, & Son, 2816 N. 4th St, Phila. Pa.
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Butterworth, H. W. & Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Mass.
Draper Company, Hopedale, Mass.
Easton-Burnham Co., Pawtucket, R. I.
Fairmount Machine Co, 22d and Wood Sts, Philadelphia.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kilburn, Lincoln & Co, Fall River, Mass.
Leigh, Evan A, 35 Mason Building, Boston.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
McKerrow, H. G. & Co., Boston, Mass.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia, Pa.
Philadelphia Textile Machinery Co, Hancock and Somerset Sts, Philadelphia, Pa.
Phillips Co, The Thomas, Providence, R. I.
Schofield, Geo. L., Philadelphia.
Stoddard, Haserick, Richards & Co, Boston, Mass.
Whitin Machine Wks, Whitinsville, Mass.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Cotton Openers and Lappers.
Howard & Bullough American Machine Co, Pawtucket, R. I.

Cutters for Knit Fabrics.
Kennedy, Thos. (Cutters, etc.,) Cohoes, N. Y.

Decoration Wash for Interiors.
De Ronde, F. S. Co., 54 John St., New York.
Moore, Benj. & Co., Brooklyn, N. Y.

Designers.
Freund, Eugene F., 140 Maiden Lane, New York.

Dextrine.
Stein, Hirsh & Co, 165 Duane St., New York.

Dryers.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Brothers, Somerville, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Butterworth, H. W. & Sons Co., Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Kenyon, D. R. & Son., Raritan, N. J.
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Philadelphia Textile Machinery Co, Philadelphia, Pa.
Phillips Co, The Thomas, Providence, R. I.
Rusden Machine Co., Warren, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Dusters.
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Dyers, Bleachers and Finishers
American Yarn Printing Works, 134-150 North 23d St., Philadelphia.
Brophy's, T, Sons, Jasper St, Philadelphia
Capstick, John & Sons, Montville, N. J.
Conoes Dye Works, Cohoes, N. Y.
Cranston Worsted Mills (yarns), Bristol, R. I.
Davidson & Brooke, 2360 No. 3d St., Philadelphia.
Duncan & Baillie, Cohoes, N. Y.
Firth & Foster Co, Kensington, Pa.
Greenwood, R. & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket and Valley Falls, R. I.
Littlewood, G. J., & Sons, Manayunk, Pa.
Lorimers, The Wm. H. & Sons Co., Phila.
Molt Bros., Millbury, Mass. (Indigo Blue.)
Pawtucket Dyeing & Bleaching Co, Pawtucket, R. I.
Philadelphia Linen Finishing Co., Frankfort, Philadelphia.
Rowland, Samuel, Schuylkill Haven, Pa.
Warren, W, Thread Works, Westfield, Mass.

Dyeing, Drying, Bleaching and Finishing Machinery.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Bros., Somerville, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Butterworth, H. W, & Sons Co Phila Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Co, 22 and Wood Sts, Philadelphia.
Granger Foundry & Machine Co, Providence, R. I.
Hopkins, Machine Works, Bridgeton, R. I.
Howard, Geo. C., 1788 Barker St., Phila., Pa.
Kenyon, D. R. & Son, Raritan, N. J.
Knapp, C. H., Paterson, N. J.
Lincoln, The, Co, 54 Arch St, Hartford, Ct.
Parks & Woolson Machine Co., Springfield, Vt.
Peel, Samuel H. Germantown, Philadelphia Pa.
Phenix Iron Foundry, Providence, R. I.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia, Pa.
Philadelphia Textile Machinery Co, Hancock and Somerset Sts, Philadelphia, Pa.
Phillips, The Thomas Co, 91-95 South Main St, Providence, R. I.
Rusden Machine Co., Warren, R. I.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass. (Drying.)
Webendorfer & Walling, Paterson, N. J.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Dye House Cans.
Hill, James Mfg. Co., Providence, R. I.

Dyehouse Floors.
Warren Bros., 143 Federal St., Boston.

Dye Sticks.
Bailey, Frank, Cedar Brook, New Jersey.
Haedrich, E. M , Philadelphia, Pa.

Dyestuffs and Chemicals.
American Aniline Co., 163 No. Front St., Philadelphia.
Anchor Color Mfg. Co, 464 Cherry St, New York.
Atteaux, F. E. & Co., 174-176 Purchase St., Boston.
Berlin Aniline Works, 72 Front St., N. Y.
Bischoff, & Co, 87 Park Place, N. Y.
Bosson & Lane, 36 Central Wharf, Boston.
Corey, S. J, 273 Congress St, Boston.
Dilion & Co, 20 Cedar St, New York.
Farbenfabriken of Elberfeld Co, 40 Stone St, N. Y.
Geisenheimer & Co, 189 Front St, New York.
Innis & Co, 3 Cedar St, New York.
Janney, O. S, & Co, Phila. and Boston.
Johnson, Chas. A, & Co, 22 Dey St, N. Y
Johnson, Wm. G, & Co, Uncasville, Conn.
Jones, J. Howell, 18 Burling Slip, New York.
Keller, John J, & Co, 104-106 Murray St, N. Y.
Klipstein, A, & Co, 129 Pearl St, N. Y.
Koechl, Victor, & Co, 122 Hudson St, N. Y.
Kuttroff, Pickhardt & Co., New York.
Matheson, W. J, & Co, 182-184 Front St, N. Y.
Merrimac Chemical Co, Boston, Mass.
Molt Bros., Millbury, Mass. (Indigo Blue.)
N. Y. & Boston Dyewood Co, 56 Beekman St, New York.

Oakes Mfg. Co, 93 Pearl St, N. Y.
Richmond & Foley, 235 N. Front St., Philadelphia.
Roessler & Hasslacher Chemical Co, 100 William St., New York.
Schoellkopf, Hartford & Hanna Co., Philadelphia.
Sharpless Dye Wood Ext. Co, The Bourse, Phila, Pa.
Stamford Mfg. Co, 133-137 Front St., N. Y.
Sykes & Street, 85 Water St, N. Y.
Thayer, Ed. M., 106 Broad St., Boston, Mass.

Dynamos.
Sturtevant, Co., B. F. Boston.

Edgings.
See Tapes, Braids and Edgings.

Elastic Web Calendering Machines.
Knapp, C. H., Paterson, N. J.

Electrotyping and Printing.
Whitcomb, H. C, & Co, Boston.

Elevators.
Cohoes Foundry & Machine Co, Cohoes, N.Y.
Eastern Machinery Co, The, New Haven, Conn.
Jeffrey Manufacturing Co., Columbus, O.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Humphrey, S. K., 53 State St., Boston.

Electrical Construction.
Philadelphia Electric Construction Co., Philadelphia.

Electric Fans.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F., Boston.

Electric Motors.
Sturtevant Co., B. F., Boston.

Engine Foundations.
Warren Bros. Co., 143 Federal St., Boston.

Engineers, Mechanical.
American Bridge Co., The, New York.
Ferguson, John W, Paterson, N. J.
Rittenhouse, Frank, Norristown, Pa.

Exhaust Heads.
Burt Manufacturing Co., Akron, Ohio.

Fans—Exhaust and Ventilating.
See Ventilating Apparatus.

Feed Water Heaters.
Pendleton, Walter & Co., New York.

Feed Water Pumps.
Goulds Mfg. Co, Seneca Falls, N. Y.
Phœnix Iron Foundry, Providence, R. I.

Finishing Machinery.
See Dyeing, Drying, Bleaching and Finishing.

Fireproof Construction.
American Bridge Co., The, New York.

Fluted Rolls.
Cohoes Foundry & Machine Co, Cohoes, N.Y
Thurston, A. G, & Son, Box 528, Fall River Mass.

Forges.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F., Boston.

Friction Clutches.
See Clutches.

Friction Hoisting Drums.
Eastern Machinery Co., New Haven, Conn.

Fulling Mills for Woolen Goods.
Hopkins, Machine Works, Bridgeton, R. I.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter Jas, Machine Co, No. Adams, Mass.

Gas Engines.
Jones, Lewis, 60½ and Media Sts, Phila, Pa.

Gas Exhausters.
Sturtevant Co., B F., Boston.

Gear Cutting Machine.
Whiton, The D. E, Co, New London, Conn.

Generating Sets.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F, Boston.

Heating.
See Ventilating.

Heddles.
Watson, L. S, Mfg. Co, Leicester, Mass.

Hoisting Machinery.
The Eastern Machinery Co., New Haven, Conn.

Hose.
Boston Belting Co., Boston.

Hosiery Boards.
Pearson, J. T, Kensington, Pa.

Humidifying Apparatus.
American Air Moistening Co., Boston.

Hydro Extractors.
American Tool & Machine Co , Boston.
Rusden Machine Co,. Warren, R. I.
Webendorfer & Walling, Paterson, N. J.

Knit Goods Edgings, Trimmings, etc.
Cathcart, John & Co., 115 Franklin St., New York.
Cheney Bros, Silk Goods, 479 Broome St, N. Y.
Friedberger & Co, Edgings, Germantown Phila, Pa.
Fleming & Chapin, Philadelphia.
Hepner & Horwitz, Lacings, 30 Howard St, N. Y.
Kavanaugh, Geo. W., Cohoes, N. Y.
Krout & Fite Mfg. Co, Allegheny Ave. and Emerald St., Phila.
Weimar Bros, 1817 East York St, Phila. Pa.

Knit Goods Finishing Machines, Crochet, Etc.
Merrow Machine Co, The, Hartford, Conn.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 2079 E. Cumberland St, Phila Pa.

Knitting Machine Cylinders.
Paxton & O'Neill, 129 Bread St, Phila, Pa
Stafford & Holt, Little Falls, N. Y.

Knitting Machinery.
American Knitting Machine Co., Woonsocket, R. I.
Beattie, Wm. & Son, Cohoes, N. Y.
Branson Machine Co., 506 John St., Philadelphia.
Campbell & Clute, Cohoes, N. Y.
Cooper, Chas, Bennington, Vt.
Crane Mfg. Co, Lakeport, N. H.
Excelsior Knitting Machine Manufacturing Co., Allentown, Pa.
Fisher Knitting Machine Co., Utica, N. Y.
Hepworth & Co, Lehigh Ave. and Mascher St, Phila, Pa.
Jenckes, E. Mfg. Co, Pawtucket, R. I.
Jones, Lewis, 60 1-2 and Media Sts, Philadelphia, Pa.
Kennedy, Thos. (Cutters, etc.), Cohoes, N. Y.
Leighton Machine Co, Manchester, N. H.
Lindley, Geo. W., 5122 Wakefield St., Germantown, Pa.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
McMichael & Wildman Mfg. Co, Norristown, Pa.
Nye & Tredick, 606 Arch St, Phila, Pa.
Paxton & O'Neill, 127 Bread St, Phila, Pa.
Pepper Mfg. Co, Lakeport, N. H.
Scott & Williams, 2079 E. Cumberland St., Phila., Pa.
Snyder, Homer P. Mfg. Co. Little Falls, N. Y.
Stafford & Holt, Little Falls, N. Y.
Taylor, James, 835 Arch St., Philadelphia.

Knitting Needles and Supplies.
Breedon, Wm, & Son, Amsterdam, N. Y.
Cooper, Chas, Bennington, Vt.
Corey, Wm, Co, Manchester, N. H.
Crane Mfg. Co , Lakeport, N. H.
Dodge Needle Co., Manchester, N. H.
Ives, Loyal T, New Brunswick, N. J.
Kavanaugh, Geo. W., Cohoes, N. Y.
Lydall, H, & Foulds, Manchester, Conn.
Manufacturers' Supplies Co., 66 No. 4th St. Philadelphia.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
Page Needle Co , Chicopee Falls, Mass.
Treat, Orion, Manchester Green, Conn.
Wardwell Needle Co, Lakeport, N. H.

Laboratory Outfits.
Bullock & Crenshaw, 528 Arch St. Phila, Pa

Looms.
Crompton & Knowles Loom Works, Worcester, Mass.
Draper Company, Hopedale, Mass.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Furbush, M. A, & Son Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St, Phila., Pa. (For wire.)
Kilburn, Lincoln & Co, Fall River, Mass.
Leigh, Evan A., 35 Mason Bldg., Boston.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Whitin Machine Works, Whitinsville, Mass.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Lubricators.
Ameledema Oilless Bearing Co., Berkeley St., Wayne Junction, Philadelphia.
Dixon, Jos., Crucible Co, Jersey City, N. J.

Lumber.
Stearns, A. T, Lumber Co, Neponset, Mass.

Lumpers.
Gerry, George, & Son, Athol, Mass.

Machinery Dealers.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Schofield, Geo. L. Phila., Pa.
Taylor, James, 835 Arch St., Philadelphia.

Machinists' Tools.
Whiton, The D. E. Co, New London, Conn.

Mails.
Walder, J, Paterson, N. J.

Manufacturers' Agent.
Cunningham, Jas. D, 1001 Chestnut St, Philadelphia, Pa.

Mechanical Draft.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F., Boston.

Measuring and Folding Machines.
Curtis & Marble Machine Co, Worcester, Ms.
Elliott & Hall, 544 Hermon St, Worcester Mass.

Mercerizing Machinery.
Butterworth, H. W. & Sons, Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Rusden Machine Co., Warren, R. I.

Mill Brushes.
See Brushes.

Mills For Sale.
Denny, R. B., 143 Federal St., Boston.

Mill Builders and Engineers.
American Bridge Co., The, New York.
Ferguson, John W, Paterson, N. J.

Mill Supplies.
American Supply Co, Providence, R. I.
Bamford & Smith, Pascoag, R. I.
Bristol, The, Co., Waterbury, Conn
Buckley's, Benj. Son, Gun Mill, Paterson, N. J.
Dixon Lubricating Saddle Co., Bristol, R.I.
Easton-Burnham Co., Pawtucket, R. I.
Holmesburg Banding Mfg. Co., Holmesburg, Pa.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Jeffrey Manufacturing Co., Columbus, O.
Thurston, A. G, & Son, Fall River, Mass.
Watson, L. S, Mfg.Co, Leicester, Mass.

Napping Machines.
American Napping Machine Co, Williamstown, Mass
Ardrey, S. B, & Sons, Bristol, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Jones, Lewis, 60 1-2 and Media Sts., Philadelphia, Pa.

Noils (Silk.)
Ryle, Wm. & Co., 54 Howard St., N. Y.
Malcolm Mills Co., Frankford, Pa.

Numbering Machine.
Bates Machine Co., 346 Broadway, New York.

Oil Filters.
Burt Manufacturing Co., Akron, Ohio.

Packing.
Boston Belting Co, Boston.
Jenkins Bros., New York.

Paint.
DeRonde, F. S. Co, 54 John St., New York City.
Moore, Benj. & Co, Brooklyn, N. Y.

Painting and Whitewashing Machine
Triumph Machine & Manufacturing Co. 209 Hester St, New York, N. Y.

Pantagraphs for Mill Engraving.
Johnson, C. A, & Co, 22 Dey St, New York.

Patterns of European Novelties.
European Pattern supply Co., 530 Broadway, N. Y.

Patent Soliciters.
Crosby & Gregory, 34 School St, Boston, Mass.
Siggers, E. G., Washington. D. C.
Wright, Brown & Quinby, 53 State St, Boston, Mass.

Pavers & Paving Materials.
Warren Bros. Co., 143 Federal St., Boston.

Perforated Metal.
Beckley, A. J. & Co., Garwood, N. J.
Fraser & Chalmer, Chicago, Ill.
Harrington & King Perforating Co., 230 North Union St, Chicago. Ill.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co., 100 William St, New York.

Picker Sticks.
Loom Picker Co., Biddeford, Me.

Picking, Carbonizing and Garnetting.
Garfield Woolen Co, Garfield, N. J.

Pipe Covering.
Keasby, R. A. 83 Warren St, New York.
Norristown Covering Co., Norristown, Pa.

Pneumatic Conveying.
See Ventilating.

Power Transmitting Machinery.
Ameledema Oilless Bearing Co, 149 West Berkley St, Wayne Junction, Pa.
Channon, H, Co, 25 Market St, Chicago, Ill.
Christiana Machine Co., Christiana, Pa.
Eastern Machinery Co, New Haven, Conn.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jeffrey Manufacturing Co., Columbus, O.
Kilburn, Lincoln & Co Fall River, Mass.
Link Belt Machinery Co, Chicago, Ill.
Rusden Machine Co., Warren, R. I.
Saginaw Manufacturing Co., Saginaw, Mich.

Presses.
Boomer & Boschet Press Co., 338 West Water St., Syracuse, N. Y.
Butterworth, H. W. & Sons Co., Philadelphia
Crawford, J. J, & Son, Nashua, N. H. (Power Screw, Hydraulic, Hollow Steam Plate.)
Curtis & Marble Machine Co, Worcester, Ms.
Hart, Charles, Frankford, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Phillips Co, The Thomas, Providence, R. I.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Printers (Fabrics and Yarn.)
Capstick, John & Sons, Montville, N. J.
American Yarn Printing Works, Philadelphis.

Pulleys.
See Power Transmitting Machinery.

Pulley Covers.
Warren Mfg, Co., Chicago, Ill.

Pumps.
Goulds Mfg. Co, Seneca Falls, N Y.
Rusden Machine Co., Warren, R. I.

Quills.
Parker, Henry Co, Springfield, Vt.

Reed and Harness Manufacturers.
American Supply Co, Providence, R. I.
Walder, J, Paterson, N. J.

Ribbons.
Chenev Bros, S. Manchester, Ct.

Ring Travellers.
DeHaven Mfg Co, The, 50 Columbia Heights, Brooklyn, N. Y.
National Ring Traveller Co., Providence, R. I.
Morley Button Mfg. Co., Boston.

Roofing Asphalt.
Warren Bros. Co., 143 Federal St., Boston.

Roofing, Gravel, Slag and Composition.
Eastern Granite Roofing Co., Jersey City N. J.

Roofing Materials (Manufacturers).
Warren Bros. Co., 143 Federal St., Boston.

Rope Transmission.
American Mfg. Co., New York.
Channon, H. Co., Chicago.
Holmesburg Banding Mfg. Co., Holmesburg, Pa.

Rove Traverse.
Rawlins, J. H, Chester, Pa.

Roving Cans.
Hill, James Mfg. Co., Providence, R. I.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.
Laminar Fibre Co., No. Cambridge, Mass.
Walrus Fibre Mfg. Co., Medford, Mass.

Rubber Covered Rollers and Goods.
Boston Belting Co., Boston.

Saddles and Stirrups.
Dixon Lubricating Saddle Co., Bristol, R. I.

Schools.
American Correspondence School of Textile, New Bedford, Mass.
Lawrence Scientific School, Cambridge, Mass.
Lowell Textile School, Lowell, Mass.
New Bedford Textile School.
Philadelphia Textile School, Phila, Pa.

Screens (Perforated.)
See under Perforated Metal.

Sewing Machines and Supplies.
American Machine Co., 420 Library St., Phila.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Bros., Somerville, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Excelsior Sewing Machine Co., Philadelphia.
Manufacturers' Supplies Co., 66 No. 4th St., Philadelphia.
Nye & Tredick, 606 Arch St, Phila, Pa.
Rusden Machine Co., Warren, R. I.
Scott & Williams, 6th and Arch Sts, Phila, Pa.
Union Button Sewing Mch. Co., 164 High St., Boston.
Wilcox & Gibbs S. M. Co., New York.

Shearing Machinery.
See Dyeing, Drying, Bleaching and Finishing.

Shell Rolls.
Cohoes Foundry & Mach. Co, Cohoes, N. Y.
Thurston, A. G, & Son, Box 528, Fall River, Mass.

Shoddies.
See Wool Shoddies.

Shuttles.
See Bobbins, Spools, Shuttles, Etc.

Silk Machinery.
Butterworth, H. W. Sons Co, Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Knapp, C. H., Paterson, N. J.
Mason Machine Works, Taunton, Mass.
Rusden Machine Co., Warren, R. I.
Webendorfer & Walling, Paterson, N. J.

Singe Plates.
Butterworth, H. W. Sons Co., Philadelphia.
Taunton-New Bedford Copper Co., New Bedford, Mass.

Singeing Machines.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Brothers, Somerville, Mass.
Butterworth, H. W. Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Ms.
Granger Foundry & Machine Co., Providence, R. I.
Knapp, C. H , Paterson, N. J.
Rusden Machine Co., Warren, R. I.

Sizing, Starch and Gums.
Stein, Hirsch & Co, 165 Duane St, New York.

Slashers.
Cohoes Foundry & Machine Co, Cohoes, N. Y.
Lowell Machine Shop, Lowell, Mass.
Phillips & The Thomas, Providence, R. I.

Soaps.
India Alkali Works, Boston, Mass.

Spindles.
Bamford & Smith, Pascoag, R. I.
Buckley, Benj's, Sons, Gun Mill, Paterson, N. J.
Draper Company, Hopedale, Mass.
Easton-Burnham Co., Pawtucket, R. I.
Ward & Vandegrift, Elmer, N. J.
Whitin Machine Wks, Whitinsville, Mass.

Spindle Tubes.
Bamford & Smith, Pascoag, R. I.

Spinning Cylinders.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Spinning Frames.
See Cotton Machinery.

Spinning Frames for Wool
Woonsocket Machine and Press Co., Woonsocket, R. I.

Spinning Rings.
Draper Company, Hopedale, Mass
Whitinsville Spinning Ring Co, Whitinsville, Mass.

Spinning Tubes.
Buckley, Benj's. Son, Gun Mill, Paterson, N. J.

Spools. *See Bobbins, Spools Shuttles, Etc.*

Sprinklers.
International Sprinkler Co., Philadelphia, Pa.

Stamps and Checks.
Michael, A. M. Albany, N. Y.

Steam Boilers.
Babcock & Wilcox Co., The, 29 Cortland St., New York City.
Brown, C. H, & Co, Fitchburg, Mass.
Lee-Odlum Co., Memphis, Tenn.
Pendleton, Walter & Co., New York.

Steam Boiler Compound.
Straus & Co., 55 Broad St., New York.

Steam Boiler Insurance.
Hartford Steam Boiler Inspection & Insurance Co, Hartford, Conn.

Steam Engines.
American Blower Co., Detroit, Mich.
Brown, C. H, & Co, Fitchburg, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Hooven (The), Owens & Rentschler Co, Hamilton, O.
Pendleton, Walter & Co., New York.
Rusden Machine Co., Warren, R. I.
Sturtevant, B. F. & Co., Boston.

Steam Surface Coverings.
Keasbey, Robert A., New York.
Norristown Covering Co., Norristown, Pa.

Steam Specialties.
Butterworth, H. W. Sons Co., Philadelphia.
Rusden Machine Co., Warren, R. I.
Jenkins Bros., New York.
Sturtevant Co., B. F., Boston.

Steam Valves.
Jenkins Bros., New York.

Tanks, Tubs and Vats.
Caldwell Co., W. E. 202 Brook St., Louisville, Ky.
Cypress Lumber Co, Apalachicola, Fla.
Lee-Odlum Co., Memphis, Tenn.
Lewis, H. F. & Co., New Orleans, La.
Rusden Machine Co. Warren, R. I.
Stearns, A. T, Lumber Co, Neponset, Mass.
Woolford, George, 2240 No. 9th St, Phila, Pa.

Tapes, Braids and Edgings.
Cathcart, John, & Co, 115 Franklin St, N. Y.
Fleming & Chapin, Philadelphia.
Friedberger Mfg. Co, Germantown, Pa.
Krout & Fite Mfg. Co., Allegheny Ave. and Emerald St., Philadelphia.
Weimar Bros, 1817 East York St, Phila, Pa.

Telephones.
Mianus Electric Co., Mianus, Conn.
Philadelphia Electric Construction Co Philadelphia.
Plummer, F. O. 620 Atlantic Ave., Boston.

Tentering Machines.
See Dyeing, Bleaching Machinery, Etc.

Tension Pulleys.
Ameledema Oilless Bearing Co., Wayne, Junc., Phila. Pa.
N. E. Ventilating & Heating Co, 980 Manton Ave, Providence, R. I.

Testing Machines.
Howard, Geo. C., 1783 Barker St., Phila., Pa.

Towers.
Caldwell Co., W. E. 202 Brook St., Louisville, Ky.
Lee-Odlum Co., Memphis, Tenn.

Trimmers.
The American Machine Co., 420 Library St., Philadelphia.
Excelsior Sewing Machine Co , Philadelphia.

Turbines.
(See Water Wheels.)

Valves—Rubber.
Boston Belting Co., Boston, Mass.

Ventilating Apparatus.
Allington & Curtis Mfg. Co., Saginaw, Mich., 81 Wareham St., Boston.
American Air Moistening Co., Boston.
American Blower Co., Detroit, Mich.
Berry, A. Hun, 23 W. 1st St, Boston, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Mattern, Geo. 44 East 8th St., New York.
New England Ventilating & Heating Co, Providence. R. I.
New York Blower Co., New York.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philapelphia.
Philadelphia Textile Machinery Co, Hancock St, above Lehigh Ave, Phila, Pa.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Wall Whitening.
DeRonde, F. S. Co, 54 John St, New York City.
Moore, Benj. & Co, Brooklyn, N. Y.

Washers (Cloth).
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Brothers, Somerville, Mass.
Butterworth, H. W. & Sons Co., Philadelphia.
Hopkins, Machine Works, Bridgeton, R. I.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Phillips Co, The Thomas, Providence, R. I.
Rusden Machine Co , Warren. R. I.
Webendorfer & Walling, Paterson, N. J.

Waste.
Kay, John J, Philadelphia, Pa.

Watchman's Clocks.
Eco Magneto Clock Co, 620 Atlantic Ave, Boston.
Nanz & Co, 127 Duane St., New York.
Philhdelphia Electric Construction Co., 1328 Chestnut St., Philadelphia.
Waggoner Watchman Clock Co., Grand Rapids, Mich.

Waterproof Floors.
Warren Bros. Co., 143 Federal St., Boston.

Water Wheels.
Bradway, C. P., W. Stafford, Ct.
Christiana Machine Co., Christiana, Pa.
Hunt, Rodney, Machine Co, Orange, Mass.
Leffel, James, & Co, Springfield, O.

Water Wheel Governors.
Bradway, C. P, West Stafford, Ct.
Cohoes Foundry & Machine Co, Cohoes, N. Y.
Leffel, James & Co, Springfield, Ohio.
Lombard Water Wheel Governor Co, 61 Hampshire St, Boston.

Winders. (Buck.)
Taylor, Jas., 835 Arch St., Philadelphia.

Winders. (Hosiery.)
Universal Winding Co, 226 Devonshire St, Boston.

Wire Cloth.
Fraser & Chalmer, Chicago, Ill.

Wire Goods.
DeHaven Mfg Co, The, 50 Columbia Heights, Brooklyn, N. Y.

Wood Pulleys.
Saginaw Manufacturing Co, Saginaw, Mich.

Wool Cleaning Compound.
India Alkali Works, Boston.

Wool Combing Machinery.
Crompton & Knowles Loom Works, Worcester, Mass.
Leigh, Evan A. 35 Mason Bldg., Boston.

Wool Extracts.
Garfield Woolen Co, Garfield, N. J.

Wool and Waste Dusters.
Atlas Foundry and Mch. Co., Newark, N. J.
Gerry, Geo, & Son, Athol, Mass.
Sargents', C. G., Sons, Graniteville, Mass.
Stillman-Randall Machine Co, Westerly. R. I.

Woolen and Worsted Machinery.
Altemus, W. W, & Co, 2816 N. 4th St, Phila, Pa.
American Tool and Machine Co., Boston.
Arlington Mch. Works (Arthur Birch), Arlington Heights, Mass.
Atlas Foundry and Mch Wks., Newark, N.J.
Birch Brothers, Somerville, Mass.
Butterworth, H. W. Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Works, 23d and Wood Sts, Philadelphia.
Furbush, M. A. & Son Machine Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Kenyon D. R. & Son, Raritan, N. J.
Leigh, Evan A. 35 Mason Bldg, Boston.
Parks & Woolson Machine Co., Springfield, Vt.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Philadelphia.
Phillips Co. The Thomas, Providence, R. I.
Roy, B. S. & Son, Worcester, Mass.
Rusden Machine Co., Warren, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Schofield, Geo. L., Philadelphia.
Stoddard, Haserick, Richards & Co, Boston, Mass.
Woonsocket Machine & Press Co Woonsocket, R. I.

Wool, Hair and Noils.
Becker, Chas. W, Agt, Amsterdam, N. Y.
Fowles & Co, 106 Church St, Phila.

Wool Shoddies.
Becker, Chas. W, Agt, Amsterdam, N. Y
Garfield Woolen Co, Garfield, N. J.
Slack, Wm. H. B., & Bro, Springfield, Vt.

Wool Washing, Preparing and Drying Machinery.
Hunter, Jas. Machine Co., No. Adams, Mass.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia.
Phillips Co, The Thomas, Providence, R. I.
Sargent's, C. G, Sons, Graniteville, Mass.

Yarns, Threads, Etc.

Banding.

Holmesburg Banding Co., Holmesburg, Pa.
Moore, C. & Co, 12 S. 5th St, Phila, Pa.
Warren, W, Thread Works, Westfield, Mass.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Tucker & Cook Mfg. Co, Conway, Mass.
Whittier Cotton Mills, Lowell, Mass.

Cotton Yarns.

American Cotton Yarn Exchange, 67 Chauncy St., Boston.
Catlin & Co. New York and Boston.
Colchester Mills, 346 Broadway, New York.
Dexter Yarn Co., Pawtucket, R. I.
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WOOLEN CARDERS.

1696 **Carder,** or secondhand. Experienced on cassimeres, cloakings, blankets, shawls, jeans, and is familiar with Furbush, Bridesburg and Smith cards. Wants position in Western or Southern States. Can take place immediately. Age 30; American; single.

1701 **Boss Carder.** Age 39; English; married. Has had large experience as boss carder in Canadian mills, and has worked in New England mills, also held positions in England before coming to this country. He has worked on all kinds of wool, cotton, waste, mungo and shoddy mixes, cassimeres, dress goods, knit goods and blankets. Can take position at once. Excellent references.

1707 **Overseer of Carding.** Worked for 21 years in a woolen mill as boss carder, but through sickness was obliged to resign his position. Is now ready and wants a situation at once. Age 49; American; married. Wants $3 a day. Has worked on dress goods and flannels.

1643 **Woolen Carder.** Age 45; American; married. Has worked as overseer in first-class N. E. mills for the past 18 years. He is at present employed, but wishes to better himself. Could leave on a week's notice. Has worked on cassimeres, dress goods, flannels and underwear. A good manager of help and thoroughly competent and eliable.

COTTON CARDERS.

1734 **Boss Carder.** Age 47; Irish; married. Been in a mill all his life. Held position of secondhand for several years and for the past 10 years or more has held the position of boss carder. Prefers New York state. Cotton, wool, percentages, waste batches.

1751 **Carder and Spinner.** Can give first-class references as to character and ability. Has had twenty-one years' experience as overseer on both American and Englih systems of carding. An American; 45 years old. Has worked on fine and coarse, also colored cotton.

1662 **Overseer Cotton Card Room.** Age 51; American, married. Not employed at present and could take a position at once. Has worked on all kinds of goods in order mills, and is familiar with all kinds of machinery. Refers to former employers.

1718 **Second-Hand in Cotton Card Room.** Has had 10 years' experience in N. E. mill. Understands all makes of machines. Can make all changes from 1 to 20 hank. Has taken course in cotton spinning at American Correspondence School of Textiles, New Bedford. First-class references. Would start at $2 00 a day. Young man and strictly temperate.

1720 **First Class Cotton Carder or Supt.** Has had the advantage of a great deal of experience in the various departments, and is thoroughly posted on all details of manufacturing and machinery. Would accept a position North or South. 36 years of age; American; married. Worked on print cloths, twills and sheetings. Has had charge of bleaching.

1736 **Overseer Cotton Card Room and Combing.** Age 39; married. Has been overseer for past nine years. In last position seven years. Started up two large rooms with combers in each. Thoroughly understands all machinery in card room, and has run all grades of cotton. Can furnish references, if required.

WOOLEN SPINNERS.

1648 **Boss Woolen Spinner.** 47 years old. 28 years' experience. Worked on all kind of stock, from ¼ to 12 run. Temperate, steady, and refers to past employers. Will work for moderate salary. Not employed and could come at once. Experience on cassimeres, flannels, beavers, knit goods dress goods, blankets, shawls.

1732 **Boss Spinner.** Age 54; English; married. Has had a large experience as fixer and boss spinner in N. E. mills. Dress goods, beavers, kerseys, shoddy and shoddy mixes, blankets, jute, worsted tops and felts. Refers to past employers.

1595 **Overseer Worsted Spinning.** 10 years as overseer of spinning, twisting, reeling, dressing, spooling on worsted yarns English-human; age 41, married. Now employed, but does not like section of country. A first-class man in every respect.

1709 **Worsted Spinner or Section Hand.** Age 22 and unmarried. At present employed, but not satisfied with surroundings. Would accept moderate pay.

1601 **Woolen Spinner,** or painter and glazer in any kind of mill. Age 31; Irish; married. Wants $10 50 per week. Has worked on cheviots, overcoatings, broadcloths, satinets, hosiery, yarns, etc.

1647 **Overseer Cotton Mule Spinning.** Seven years' experience as secondhand. Wishes to get an overseer's job. Prefers Mason mules. Age 38; Catholic, married. At present employed. Experience on prints, sateens, lawns, twills, etc. Will work for moderate salary.

COTTON SPINNERS.

1636 **Overseer Cotton Spinning, Spooling, Warping, Etc.** Has held position seven years of second-hand and has taken textile school courses. Having had unusual opportunities to learn, he feels competent to take position as overseer. Highly recommended by present employers.

1655 **Overseer of Cotton Spinning.** 42 years old; married. Experience as a spinner covers a period of 30 years in first-class N. E. mills. Has worked principally on fine yarns, 30's to 200's. Had some experience on coarse numbers. First class references.

1364 **Mules or Frames.** 34 years old; married. Thoroughly understands all makes of English and Mason mules. Has set up machinery and been expert fixer. Wants good position as overseer of mule room, or would take charge of frames. Accept $3.50 per day. Best references.

1663 **Overseer Mule Room.** Eleven years' experience in Fall River mills, and for the past ten years overseer of mule room. Excellent reference from present employer. Age 44, married.

1698 **Overseer of Mules.** 34 years old; married; English. 10 years' experience, chiefly on English mules, on all grades of cotton yarn. Would like to get a large job.

1703 **Overseer Ring Spinning, Warping and Spooling.** Is experienced on white work from Nos. 4's to 30's. Is familiar with Whitin and Lowell Machine Shop spinning frames and spoolers and warpers. Wants $3 per day to start with. Age 39; American; married.

1690 **Cotton Mule Spinner.** Age 42; French; married. Has worked on prints and sheetings and on yarns from 9's to 50's. First class references. Two years' experience as secondhand and five as overseer. Wants $2.50 per day to start with.

WOOLEN WEAVERS.

1654 **Boss Woolen Weaver.** Has had 12 years' experience as fixer and two years' as boss weaver. Has worked on fancy worsteds, cotton worsteds and coverts. Is familiar with Crompton & Knowles machines. Age 37; English, married. At present employed. Can take a position with two weeks' notice.

1645 **Overseer Weaving.** Age 30; married, American. Has worked in weave room since he was 17 years old, as weaver, fixer and secondhand of weaving, except for a short time was traveling salesman. Has worked on ladies' dress goods, men's fine worsted suitings, overcoatings, cloakings, etc., on Crompton & Knowles and Jacquard looms. Excellent references.

1413 **Boss Weaver or Designer.** American; age 49. Has worked on beavers, kerseys, dress goods, cassimeres and all kinds of men's wear. Is also a good loom fixer.

1712 **Second-Hand or Overseer of Weaving.** Age 29; American; single. Has some knowledge of designing. Has worked on fancy worsteds, cassimeres and cheviots. Wants $2.50 per day to start with. Is familiar with Crompton & Knowles machines.

1688 **Overseer of Weaving** in large mill, designer in small mill, or assistant designer in a large mill. Age 38; German; single. Has worked on beavers, chinchillas, fine cassimeres, fine fancy worsteds, ladies' dress goods, army goods, union cassimeres and other classes of goods. Strictly temperate and industrious.

COTTON WEAVERS.

1681 **Overseer or Secondhand of Cotton Weaving.** Has had long experience as loom fixer, secondhand and overseer, and can furnish excellent references. Has also had charge of cloth hall and drawing departments. With one mill was 15 years.

1687 **Overseer of Weaving.** Age 30; Scotch; married. Has worked on taffetas, grogran, satins, serges and grenadines, all kinds of plain and fancy cottons and lenos. Is familiar with Crompton & Knowles and Whitin looms. Wants $4 per day.

1668 **Overseer of Weaving.** Age 41; English; married. Has had large experience as loom fixer and secondhand of weaving, and is competent to take an overseer's job. Has worked on shirtings, sheetings, sateens, fancy lenos, and all grades of fine goods all the way from 2 to 28 harness.

1652 **Overseer Cotton Weaving.** Worked on about all kinds of cotton goods. Age 41, American, married. At present employed in the South, but wants to change for a healthier locality. Refers to present and past employers.

KNITTERS.

1084 **Overseer of Knitting and Finishing.** Age 33; married. Has just resigned position in the South on account of climate, and is ready to take place at once. Can furnish best of references.

1182 **Knitting Mill Supt.** A practical man, having had charge of each and every department in mill before becoming supt. Can furnish references as to character and ability. Wants to become associated with a reliable firm. Would take an interest in stock company starting a new mill. Is familiar with all makes of machinery and all classes of knit goods. Age 40; American; married.

1755 **Boss Knitter or Fixer.** Has worked on eiderdowns, astrachans, cardigan jackets, balbriggans, rubber linings and fancy knit goods. Will not change for less than $3 a day.

598 **Boss Knitter or Supt.** Age 48; married. Is thoroughly familiar with the manufacture of all classes of seamless hosiery, and can take any position at short notice.

1694 **Asst. Supt.** or foreman of finishing room. Age 30; married; American. Large experience in first class mills, and excellent references. Thoroughly understands the manufacture of children's, men's and ladies' flat and fleeced lined goods and underwear. Can repair all kinds of sewing machines and can take position at once.

1554 **Boss Knitter.** Underwear, Jersey ribbed, lisle, wool, plaited work, silk. Can handle any latch machine. Good references. Age 26; married.

1597 **Boss or Second-hand Underwear Knitter.** Can accept position at once. Experience covers men's, women's and children's high, medium and low grades. Scott & Williams, Nye & Tredick, Snyder & Fisher machines.

1492 **Boss Knitter.** Age 27; single; American. Worked in New York State mills. Is familiar with Campbell & Clute, Tompkins, McMichael & Wildman, Scott & Williams, Nye & Tredick machinery. Single and double plush work, balbriggan, etc.

1722 **Supt. of Knitting.** Age 37; American; married. Long experience as overseer fits him for superintendent's position. Has also worked three years in machine shop, setting up knitting machines and making the different parts of same. Has worked on cotton, wool, merino and silk; plain and ribbed hosiery and underwear. First-class recommendations.

1747 **Overseer or Supt. Seamless Knitting,** or would take traveling position with some good reliable seamless machine company. Age 38; married; American.

Wanted: A Man of Good Business Ability

And address who understands the various full automatic seamless hosiery machines, and has a good general knowledge of manufacturing hosiery, as representative of a first-class machinery building concern with established trade, to the hosiery mills in the United States. Liberal inducements to right party. Either salary or commission or both. Address, giving experience, age, and references, "Automatic 180," The Textile World, Boston.

DYERS.

1733 **Dyer.** Age 33; married; a Scotchman. Worked in Scotland, and has been over seven years in this country as secondhand for a large manufacturing concern, with whom he is at present, but desires to change to a position where he will have full charge. Has handled cotton yarn from 10's to 80's in warp and skein, also experienced on worsted and silk yarns. Can furnish references as to character and ability.

1730 **Dyer.** Overseer or would take good secondhand job. Age 24; English; single. Chain warps, filling, raw stock, underwear and hosiery yarn, print yarn, cop bleaching.

DESIGNERS.

1635 **Designer** on colored cotton dress goods, and shirtings, and fancy worsted dress goods, piece dye, jacquard work in cotton, silk filling, also lappets. Would not consider position paying less than $1200 a year. Is at present employed in one of the leading mills, making fancy cotton, and is an especially bright young man. Early training in Scotland. Has been in this country about four years.

1621 **Designer or Assistant Supt.** on men's wear worsteds, cotton worsteds, overcoatings, cassimeres. High and low stock. Has been designer in several first-class mills. Age 34; married.

1672 **Designer, Overseer of Weaving**, or assistant supt. Age 26; English; single. Has worked in various mills in England and this country. Holds first honors diploma for weaving and designing (London City Guilds). Fancy worsteds, dress goods, colored and fancy cotton goods.

1599 **Assistant Designer.** A young man who is studying woolen and worsted designing would like an opportunity to get practical experience, and will accept very small wages. Has worked in mill for two years as weaver on Crompton & Knowles looms. Excellent references as to character.

1591 **Designer** on fancy worsteds, cotton worsteds, fancy cassimeres, tweeds, fancy back overcoatings, etc. Experience in first-class N. E. mills. Age 30. At present employed, but can accept position at once.

FINISHERS.

1526 **Foreman of Finishing Room,** Folding Packing, etc. Age 45; married; English. Has worked on white and colored goods and prints. Is acquainted with every kind of machinery used in his business. Has worked 11 years in this country. Can give good references.

1351 **Boss Woolen and Worsted Finisher** is looking for a position paying $3.50 or more. Age 31; Has worked on all classes of woolen and worsted goods. Can furnish excellent references.

1658 **Overseer Woolen Finishing.** Age 35; married. A number of years' experience as overseer in first-class N. E. mills. Worked principally on kerseys, meltons, unions and cassimeres, and is familiar with Curtis & Marble, Parks & Woolson and Cleveland machines. First-class references.

1716 **Finisher.** Age 29; English; married. Has worked as wet finisher, shearer, gigger, second-hand and overseer. Prefers a mill making cassimeres, worsteds, dress goods and face finished goods. A high grade of goods. Is familiar with all kinds of American and English finishing machinery, and can keep same in the best of repairs. Prefers Eastern States. Can take position at one week's notice. Best of references.

1692 **Cotton Finisher and Corduroy** Cutter. Age 31; English; married. Large experience in England and in this country. All classes of corduroys and velvets, cutting, etc., singeing and finishing of cords. Can furnish excellent references.

1729 **Overseer of Finishing.** Age 46 20 years' experience as overseer on all kinds of woolen and union goods. Thoroughly posted on finishing low to medium grade of wool warp and cotton warp fancy cassimeres, overcoatings, cloakings, worsted suitings, also steam finished goods. Good references from present employers.

MISCELLANEOUS.

1731 **Young Man of 32 desires to go** to Japan. Is temperate. Been twenty years in cotton mill, and has had experience on many kinds of looms, including Draper. Has best of references. Holding a good position in mill now.

1744 **Fixer.** Age 24; American; single. Is familiar with Boss, Invincible, McMichael & Wildman, Brinton, Denny and Victor machines. Wants $15 a week.

1740 **Assistant Supt. and Designer,** overseer of weaving, designer, or both. Age 29; Scotch-American; married. Worked in Scotland and 5 years in this country. Fancy white and colored cotton goods, lenos, lappets, welts, dimities, sateens, Jacquard, towels and handkerchiefs.

1749 **Fixer or Boss Knitter** wishes position. Eight years' experience on knitting machinery. Experienced on Standard, Mayo and Hepworth machines. Will accept position in any state.

1583 **Cloth Room Overseer.** A young man having good experience as overseer in plain and fancy mills desires to change. Has worked on nearly all classes of cotton goods, and is recommended as a first-class figurer and good manager of help. Can take charge of cloth department and shipping where both positions are combined, or would accept position as office assistant. American; married.

1711 **Mill Engineer and Draughtsman.** American; married. Would take up other responsible duties in connection with engineering work. References of the highest character, and salary expected quite reasonable.

1713 **Foreman of Picker Room, or** Painter for some mill and weaver in winter or any other winter work. Wants employment year around. Is an all around man in woolen mill. Has worked on beavers, blankets and fancy dress goods. Wants $2 per day to start.

1726 **Superintendent** broad silks from time of leaving weave room till ready for consumer, piece dye cotton and silk mixtures included, or will accept overseership in any department connected with above. 35 years old; American; married. Is familiar with most all machinery used in this branch.

1685 **Boss Dresser or Assistant Designer.** Has taken a thorough course in designing, and is well up in calculations and in the making of fancy men's wear goods of all kinds. Has worked in Scotland and three years in this country. His knowledge of yarn calculations and practical experience as dresser tender makes him well fitted to fill a position as boss dresser and to run a room in an up to date and efficient manner, or to fill a position as designer or assistant.

1695 A young man would like to obtain a position in some Southern cotton mill as assistant supt., or some such position, where he would have an opportunity to learn the business thoroughly. Has theoretical and some practical knowledge.

1746 **Overseer Warping and Dressing,** or weaving, warping and dressing. Has worked on woolens and fancy worsteds. Is familiar with Davis & Furber dressers; Draper, Phenix and Lowell Machine Shop warpers; English plain and Crompton looms. Wants $3 a day.

COTTON MILL WANTED.

Pittsburg, Texas, has $60,000 ready to build a cotton mill, and wants practical mill man to invest $40,000 and take management. Address, First National Bank.

The Best is the Cheapest.

It is BETTER and CHEAPER to wind yarn by the "Universal" system before shipment from the mill, thus insuring perfect delivery to knitting machines without rewinding.

UNIVERSAL WINDING CO.,

F. H. BISHOP, Manager.

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MAKES OVER 3000 STITCHES PER MINUTE.

TRADE MARK.

For SEAMING, HEMMING AND OVEREDGING Flat, Ribbed and Fancy Underwear and Hosiery. And for OVEREDGING Lace Curtains, Ribbons, Belts, Hat Bands, Flannels, Blankets and other Fabrics.

IT MAKES

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4. The "OVERLOCK" TAILOR-MADE SEAM. (By means of the Feller.)

Business established in 1859.

THE ELASTICITY OF ITS STITCH EQUALS THE FULL STRETCH OF THE GOODS.

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The Bates Machine Co.
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Special Machines for Numbering Tickets.

Steel and brass stamps for all purposes.

Send for Catalogue.

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FOR MILLS AND FACTORIES.

"Puts the mill all on one floor"—does away with stair climbing—useful in a dozen ways.

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See page 102 for cut and description.

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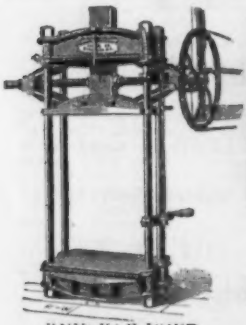

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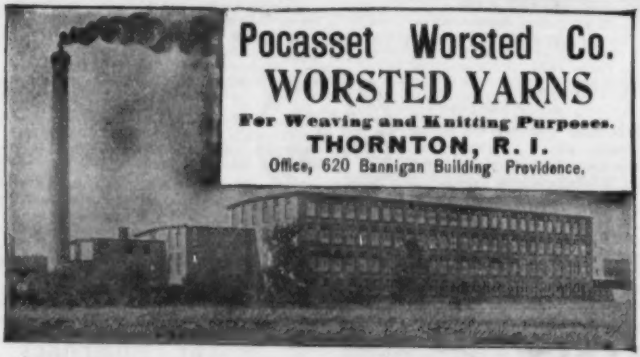

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FLYER SPUN

Mohair and Worsted

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Mohair Plushes,

Worsted and Cotton Braids.

D. COFF & SONS, Pawtucket, R. I.

ESTABLISHED 1861.

YARN DEPARTMENT.

Eastern Yarn Market.

Cotton Yarn: Notwithstanding the fact that raw cotton continues high, cotton yarn is lower. On carpet yarns, 8/3-ply and 12/3-ply, the price is considerably off, a decline is legitimate and is warranted by conditions. Under ordinary circumstances the cost of this class of yarn is not more than five cents above the cost of cotton, but the demand for these and other sizes enabled the spinners to advance price, and they were getting from seven to nine cents above the cost of cotton.

Cotton yarns used by weavers in 2/26s, 2/30s and 2/40s have also eased off; 2/26s are now selling for 20 cents per pound, against 29 cents per pound three months ago. The advance on this class of yarn has been pronounced within the last six months. The price of this yarn started at 13 cents per pound and kept advancing until 29 cents per pound was reached. Some of the weavers have been badly caught, as many contracted for yarns at high prices.

The dealers in yarn are making great endeavors to have the Southern mills shut off on night work, as they claim, and justly, that the consumption of yarn is decreasing so fast, that a large surplus will be the result, unless this curtailment takes place.

Much Southern yarn is replacing the yarn of the Eastern mills, as the knitters are finding that Southern yarn gives good satisfaction. The Eastern mills are finding that sales are not forthcoming and some of them are trying, on white-carded yarn, to sell "job lots," and making concessions accordingly.

The knitters state that, while cotton yarn is maintained at high prices, they will only purchase as requirements dictate, and in consequence there will be but a hand-to-mouth business for the spinners.

The knitters of combed Egyptian yarn have been complaining at the movement of prices on these yarns. Price on 1/20 Egyptian combed was advanced from 24 cents to 41 cents per pound, and the sales were much reduced. Some of the knitters contracted at these high prices. Now comes a reduction of nine cents per pound on all numbers of combed Egyptian, and 8½ cents on all numbers of carded Egyptian, thus leaving combed Egyptian in 1/20s combed 32 cents per pound.

The probable cause of this decline is that the price of combed yarn went so high that yarn was beginning to be imported in large blocks from England, and at prices under the domestic article.

It will prove to be a good thing in the end that yarns are coming down in price, because they were so high that the weavers and knitters using them could not see a profit on their goods, and it certainly has interfered with the dividends of more than one manufacturing concern, leaving the spinner to get all the profit.

Woolen Yarn: Spinners of woolen yarn continue busy today. More woolen spinning machinery is being employed than has been the case in many years. The prospects point rather to an increasing demand than otherwise.

Knitters are placing orders carefully, and only as stocks require. At present the fear is that wool has not reached its proper level. As soon as prices become settled, these knitters will buy with a view to their future requirements, and large orders will be placed. The hand-to-mouth policy now being pursued is likely to receive a violent shock. Spinners keep filling up their books with orders, and will later be unable to take care of the too cautious. Undoubtedly some very extra orders will be placed in August and September, when the trend of politics have been determined, and prices find their proper level; but the wool market is very uncertain, and the unknown is liable to

Frank E. Patterson, Prest. Oscar W. Wood,

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SPOOL COTTON

on 100 to 12,000 yd. Spools or Tubes.

A Specialty of Thread for Manufacturers Use
on Spools, Tubes or Bobbins.

Also Seaming and Hosiery Yarns
on Cones, Tubes or Skein.

Our bleaching and dyeing facilities are new and unsurpassed for prompt and neat work. Correspondence solicited.

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COMBED AND CARDED COTTON YARNS

From Northern and Southern Mills.

American, Egyptian, Peruvian and Sea Islands.

ARNOLD B. SANFORD, Pres. and Gen. Mgr.

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BOSTON, - - MASS.

Knitting and Weaving Yarns

Cones, Cops, Warps, Skeins,
Single, Double, Three-ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.

EDWARD S. HYDE, 223 and 225 Chestnut Street, **Philadelphia, Pa.**

happen almost any time. The knitters of rubber boot cloth have contracted largely for backing yarn, mostly, however, of a cheap character.

Fine flannels are still requiring large quantities of yarn. The fleece-lined underwear trade is largely substituting woolen spun yarn for cotton yarn. The trade requiring 2-ply yarn is also in the market. The weavers continue to call for yarn, mostly cheap yarn for overcoatings, and are beginning to contract for woolen yarn for light weights. This is extraordinary at this season, but styles have changed. The worsteds are going out of favor at present, and the coming demand is for cashmeres. This has been brought about by the present outing flannels. The woolen manufacturers are imitating them in cashmeres of light weights, and mills without woolen spinning machinery are in consequence forced to order woolen yarn. The cancellations of yarn orders have ceased to be a factor.

Wool continues to hold its own in a way never known before. The cause of this seems obvious. The wool merchants own wool at a high price, and will make concessions only under pressure. The farmers in the West are aiding in this movement, as less wool is coming forward to Boston than has been the case in years. Manufacturers are letting their stocks run down, and in some instances will not be on the market for three or four months, although after July 1st it is predicted that the wool market will take on more of a move with small sales on a conservative basis. The woolen trust has undoubtedly large amounts of wool on hand, and is trying to reduce stock as much as possible. Although some of the larger mills have many looms stopped, there is a determination not to make the price on light weights any lower (so it is stated), orders or no orders.

The cancellation of heavy weight cloth has certainly been enormous. Customers are canceling cloth on the ground that lower wool prices should

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IROQUOIS MILLS.
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Cotton, Woolen & Worsted Yarns.
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MANUFACTURERS OF
WHITE AND COLORED COTTON **WARPS**
Nos. 6s to 30s,
On Beams, Jack Spools or in Chain
CONWAY, MASS.

GRANT YARN CO.,
COMBED AND CARDED COTTON.
YARNS 40s and above. AND
FITCHBURG, MASS. **WARPS**

E. JENCKES MFG. CO.
Colored Cotton Hosiery Yarns, Double and Twist Yarns for the Weaving Trade.
PAWTUCKET, - R. I.

LINEN YARN IMPORTER.
Hughes Fawcett, 115 Franklin St., New York,
Flax, Hemp & Jute Line and Tow Yarns,
FOR WEAVING PURPOSES
Linen Jacquard Harness Twines.
Fine Cotton Harness and Heddle Twines.
For Cotton, Silk, Woolen and Carpet manufacturers. Correspondence solicited. Samples promptly furnished.

Eddy & Street,
COTTON, **YARNS** WORSTED,
WOOLEN, AND **BRAIDS** SPUN SILK.
PROVIDENCE, R. I.

CAPACITY, 50,000 Spindles.

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COMBED OR CARDED

COTTON YARNS

In Chains and Skeins, on Balls, Beams, Spools—single or twisted.

WILLIAM FIRTH, PRESIDENT. FRANK B. COMINS, TREASURER.

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The "Drosophore" and "Vortex" Humidifiers.

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WE HAVE, WITH INSTALLATIONS IN HAND, ORDERS FOR OVER 2,000 HUMIDIFIERS.

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from 2s to 26s single and ply.

SPECIALTY—FIRE HOSE CORD

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COTTON WARPS AND YARNS

In gray and all colors, single or in any twist.

COLORED COTTON

Machined, Carded or in Roving.

NOVELTY YARNS

In Cotton, Mercirized Cotton, Silk and Worsted, in various Patterns, Colors and Twists.
We are always pleased to assist our patrons of the Woolen Goods manufacture in special pattern warps for samples.
We use a uniform grade of long stapled cotton in all our manufacture.

enable manufacturers to make lower prices. One man asked a five per cent. reduction on all cloth bought, and agreed to take more cloth provided the reduction was made. The buyers are putting off deliveries as much as possible. Some of the commission men are taking the "bull by the horns," and insist that the buyers state the quantity of cloth they will require, otherwise after a certain date all orders would be called off.

There has undoubtedly been more cloth bought than the trade has need of, and large stocks are now piled up as the result of the boom. After July 1st the light weight season will call for material, both yarn and wool.

It might not be out of place to show the cause of the present conditions. The progressive movement really ceased in Europe last November, after there had been a continued advance of 70 per cent. above what had been paid for wool in 20 years. The great advance caused by a bad clip (which was really more than offset by the reduction of American imports), brought the price above the purchasing capacity of the world, and many substitutes were used, such as coarse wool and cotton. Our market followed Europe, led on by speculators, who expected to realize a profit from America. As we did not sustain the European market, the reaction set in, and is going to continue in Europe until prices reach a level of wool importations.

We submit a quotation from a recent letter from one, who had looked for low prices, while others insisted on high prices:—"We do not think that the price of merino wool is destined to be still lower. One must not lose sight of the fact that since the first of the year prices have shrunk 40 per cent. and that a reaction is probable. We believe that the next sales in London will be more active and more animated than the last and that prices will be higher. These sales will be the last of any consequence of the year, and manufacturers will undoubtedly want to make some purchases."

This we give for what it is worth. Prices cannot always decline, and the present conditions in this country can be attributed somewhat to politics.

Worsted Yarn: Spinners and weavers are looking forward to the opening of the light weight season, which takes place about July 15th. No one seems to know what is going to be called for, and are therefore waiting developments.

The weavers will place orders for yarn after the season opens, as none have large stocks on hand except possibly in fine yarn. The prices offered for yarn as feelers are entirely out of the question. The cloth buyers have some queer ideas as to what the decline in wool amounts to.

The buyers of cloth, although not ready to place orders, talk offers and

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Manufacturers of
White, Colored, Fancy and Double and Twist, **COTTON WARPS**
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DEALERS IN
MERCERIZED COTTON YARNS
All Numbers Up to 140. 2 Ply In Combed Peelers, Egyptians, & Sea Islands . . . . .
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offer 50 to 75 cents per yard less than what cloth can be made for. The weavers, by way of passing along this condition, make offers to the spinners which are 10 to 18 cents per pound less than what spinners can make the yarn for. They think nothing of offering 67½ cents for yarn worth 80 cents. It goes without saying, that spinners are turning such offers down very hard, and weavers will have to "tone up" if they expect to buy yarn. The weavers insist that the prices offered are in earnest and what they must get the yarn for in order to insure business.

It looks now as though many cheviots would be sold. This class of cloth is always staple, and there is less risk. In dress goods there is a new style of using ¼ blood yarn and then napping it and then making a smooth cloth of same.

We hear that in Lawrence one of the worsted mills has from 400 to 800 looms stopped, and another mill is running but four days a week. The mills running best are those making cotton worsted. Most of the mills manufacturing fine goods are on short time. Spinners are telling salesmen to get offers, but are not willing to make large concessions. A great deal of cotton yarn is replacing worsted yarn. In every line of manufacture this is being done. Jersey cloth, so extensively used by the rubber boot trade, is now made of part cotton. The cloth which goes into leggins, of which thousands of yards are made, was last year made entirely of worsted yarn; this year cotton yarn is largely used. It is a case of advancing prices beyond what the public are willing to pay.

French yarn spinners continue busy, and are doing more than the English system spinners. The dress goods weavers are fairly busy on a low class of goods. In spite of the present dull season we find a strong undercurrent of confidence that business is coming out all right, and that before the present year is over we shall have good business again.

The present outlook points to a continued run on ¼ to ⅜ blood worsted yarn.

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Philadelphia Cotton Yarn Market.

The present situation of the cotton yarn trade is one of continued weakness in most lines. There is a very fair volume of business being done, but at the expense of values. In knitting yarns, the deliveries are probably fully up to what they have been any time in the past six months, showing a fairly healthy condition of trade.

Prices have been cut somewhat on these, mostly by the Southern mills.

Weaving yarns have been cut to ruinous prices. In fact such figures as are less profitable to spinners today, than a year or two years ago.

The Southern spinners of weaving yarns have arranged to come North with the avowed intention of establishing an agency and selling their yarns direct to the trade, so as to advance prices. It is a fact however, that these spinners are selling their yarn on positive orders, and prices which they make themselves, to yarn merchants, and it appears as a general rule that mills which are consigning their yarn, are generally sold up and at satisfactory prices. Many spinners, now complaining, refused orders at several cents per pound above what they could get today. If they had taken these orders, it would have enabled customers to sell goods, which would have put them in better position today. The high prices asked practically stopped the manufacture of goods. The yarn merchants are trying to get spinners to shut off over time, and thus steady prices by relieving the market of this over supply.

The present extreme high price of

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cotton ought to influence yarn, and we believe if a large portion of the spinners would make positive prices on their goods, they could be obtained in a short time. Prices are more or less nominal, about as follows:—

Southern cones:—

5s and 6s	14½ to 15½
7s and 8s	15 to 16
10s	16 to 17
12s	16½ to 17½
14s	17 to 18
16s	17½ to 18½
18s	18½ to 19
20s	18½ to 19½
22s	19½ to 20½
24s	20 to 21
26s	20½ to 21½
30s	21 to 23

New England list prices (cones):—

10s	18¾
14s	19¾
20s	22½
30s	27½

Silver and Jæger 2 cents per pound higher.

Mock Egyptian three to four cents higher.

Southern Skein:—

8/1	14 to 14½
10s	14 to 14½
12s	14½ to 15½
14s	14½ to 15½
16s	15 to 16
20s	16 to 17
22s	17
26s	18

Warps (single):—

14s	14 to 14½
16s	14½ to 15
18s and 20s	15 to 15½
26s	17 to 17½

Skein:—

8/3	13 to 13½
12/2	14 to 14½
14/2	14 to 14½
20/2	16 to 16½
30/2	19 to 19½
40/2	28 to 30

Warps (two-ply):—

14s	14½ to 15
16s	15 to 16
20s	16½ to 17
30s	19 to 19½
40s	30 to 31

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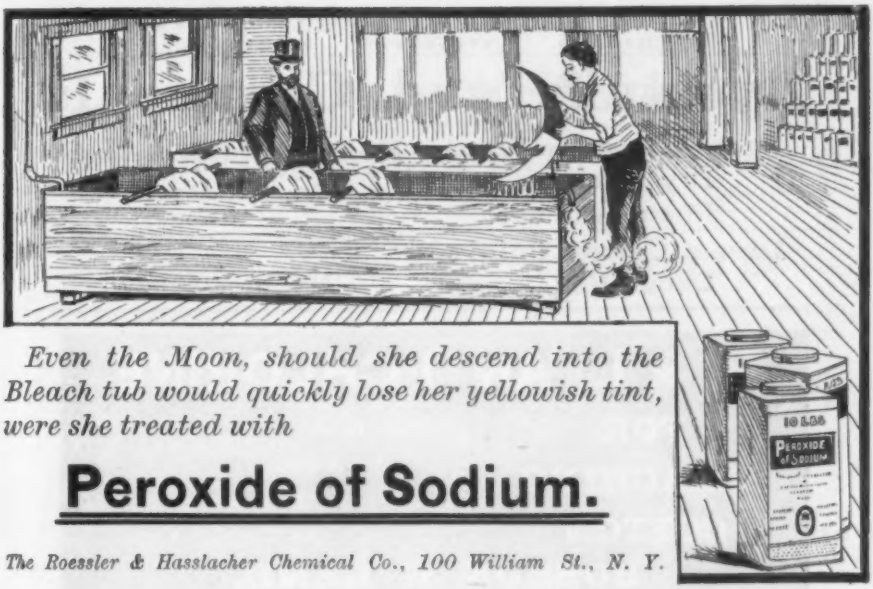

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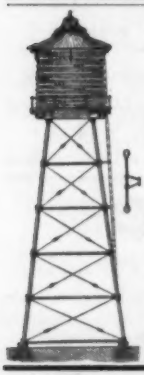

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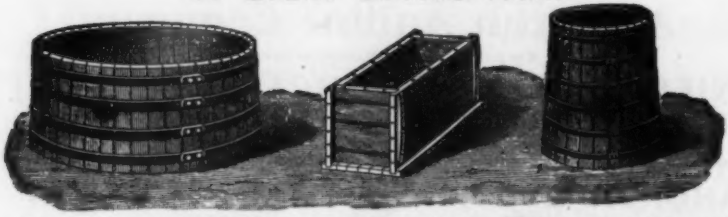

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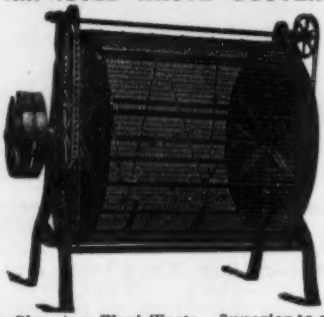

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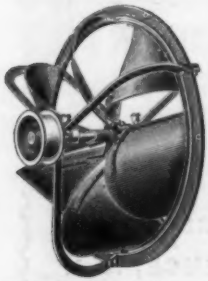

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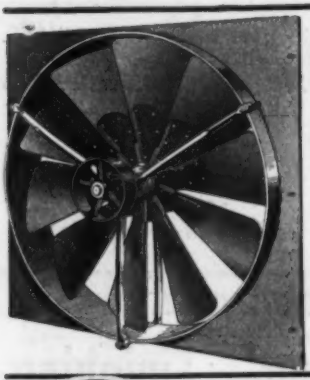

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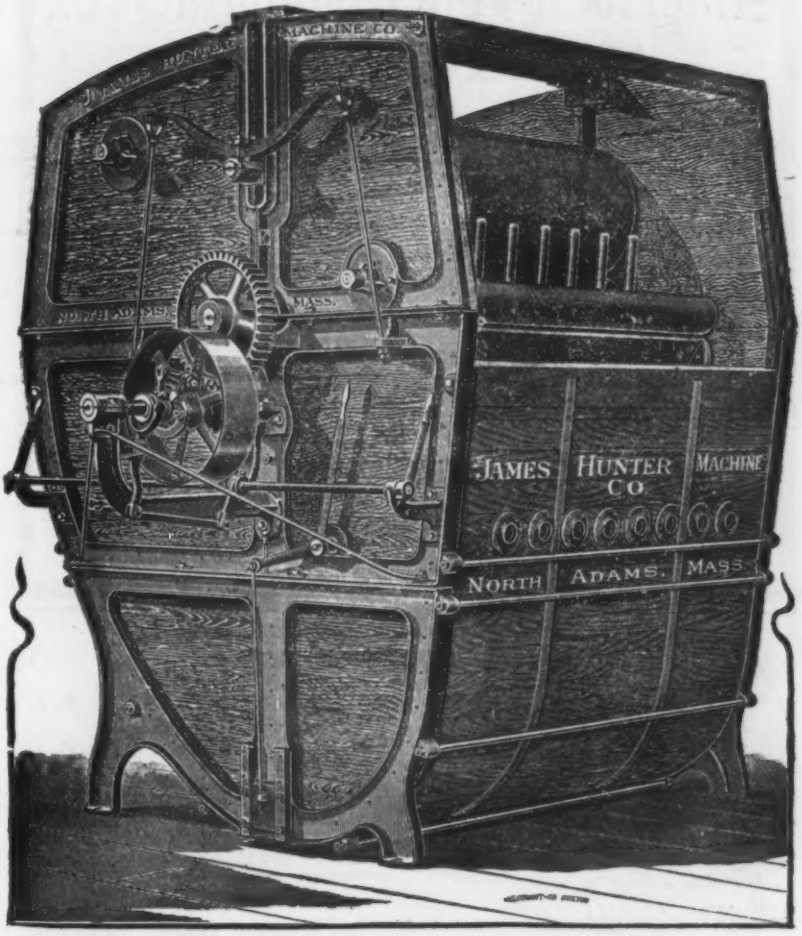

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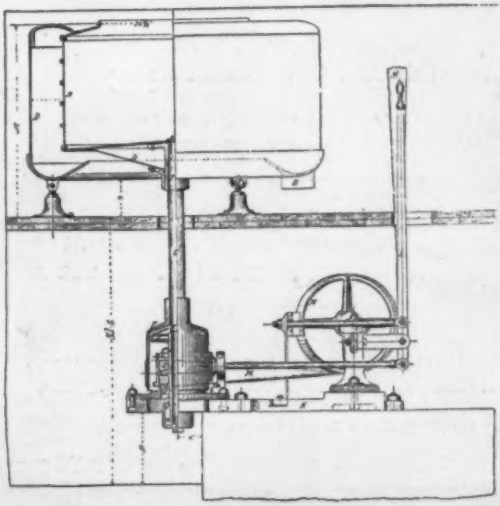

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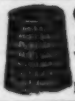

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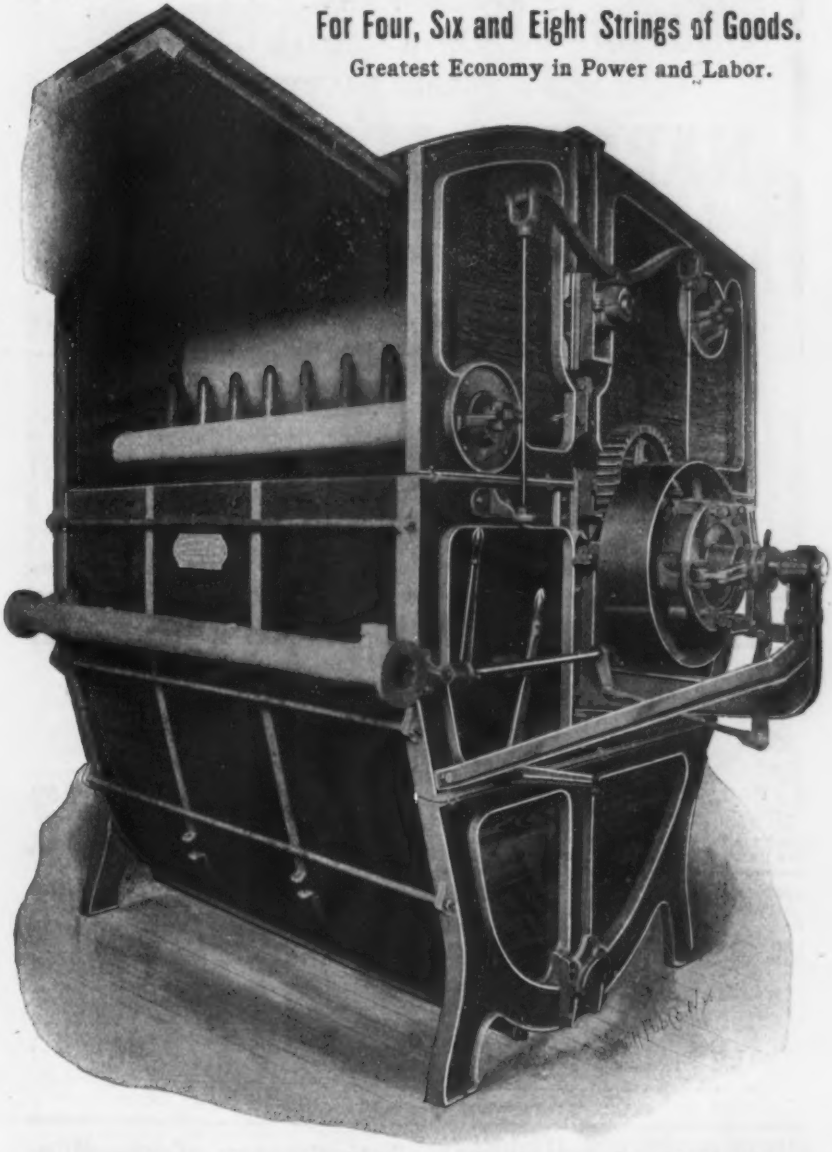

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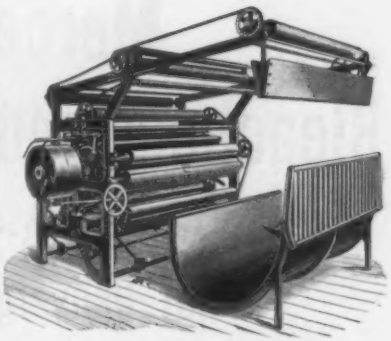

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It is the only full automatic machine made to be fastened to a bench, occupying no more space than semi-automatic machines.

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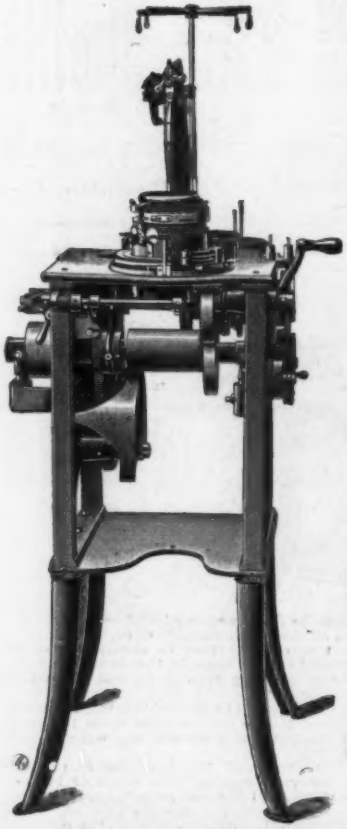

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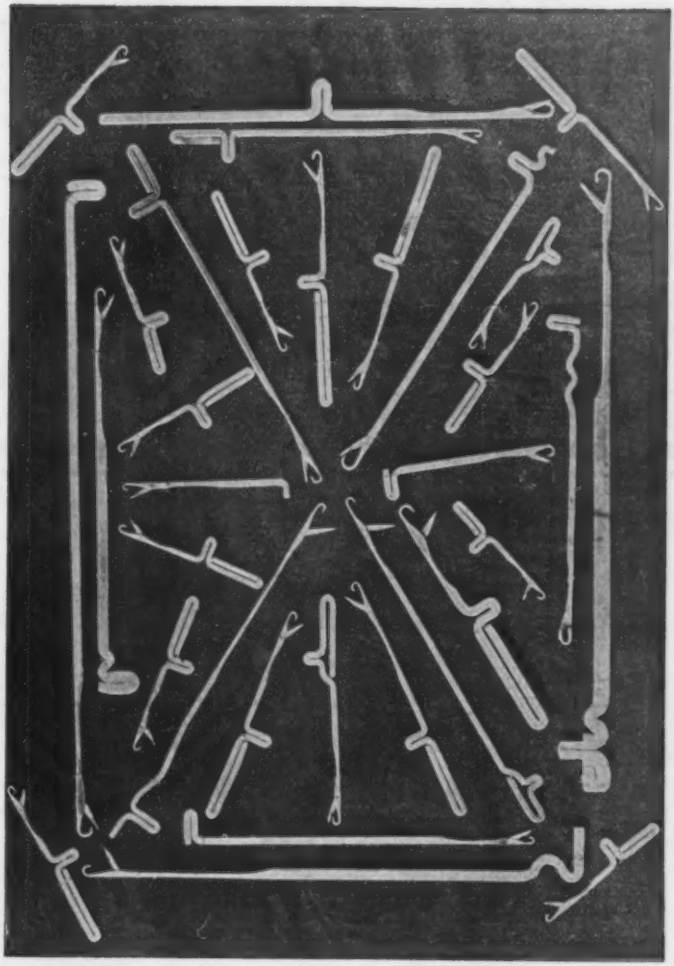

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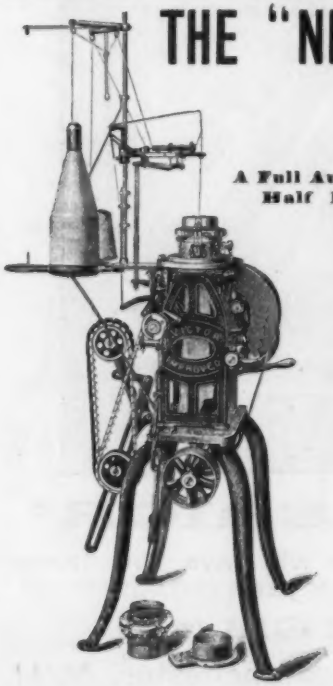

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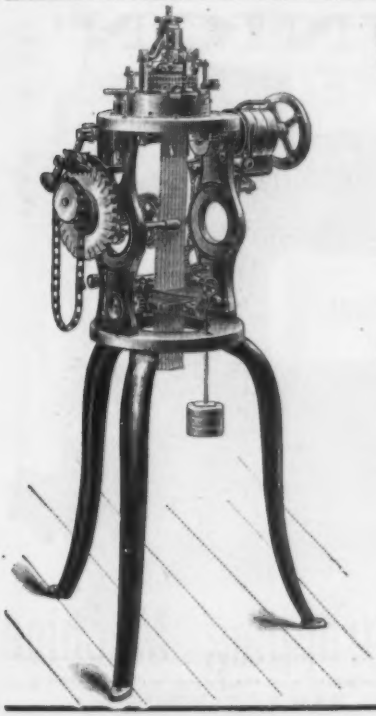

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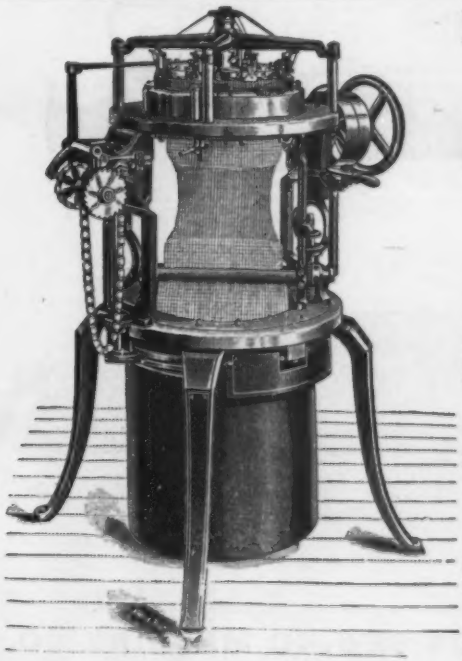

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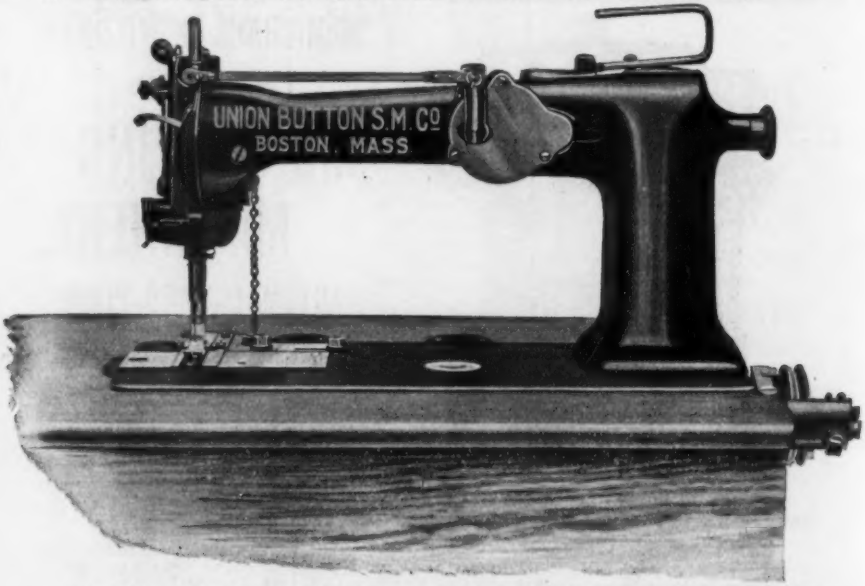

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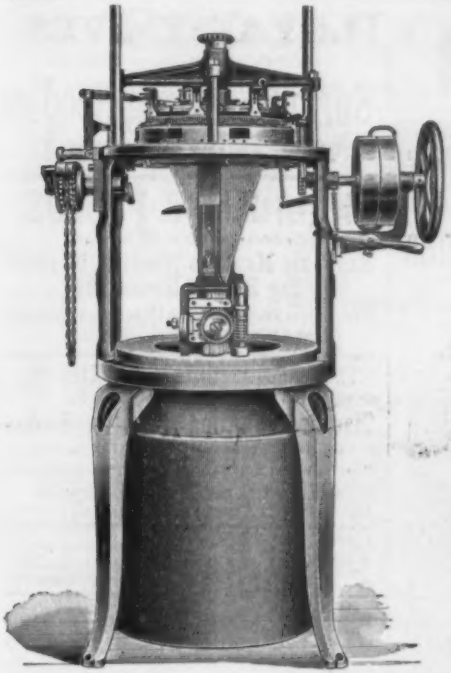

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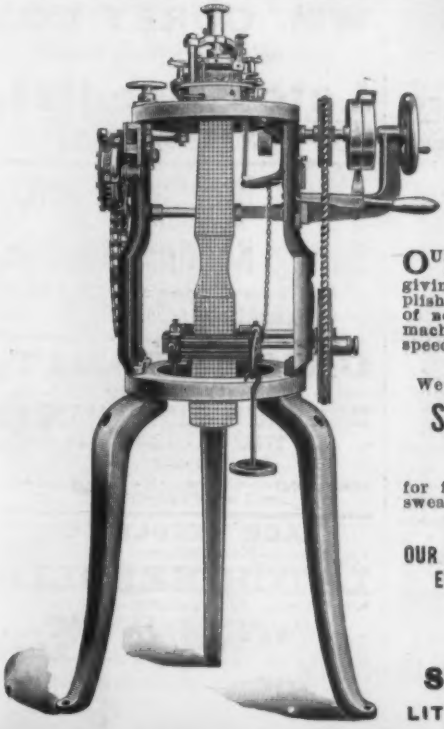

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OUR latest model machinery has been designed to run at **very high speed**, giving large production. This is accomplished with fewer seconds, less breakage of needles, less jar and wear and tear on machines than has been customary at lower speeds.

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OUR MACHINERY ENABLES MANUFACTURERS TO "LEAD THE PROCESSION" INSTEAD OF STUMBLING ALONG WITH THE CROWD.

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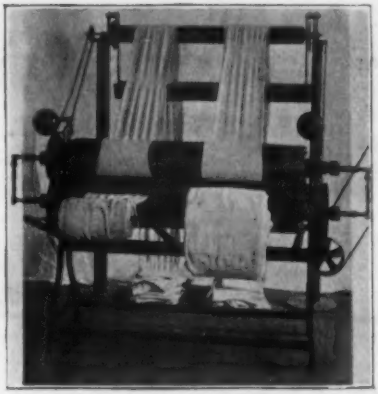
BUILDERS OF

Circular Rib Machines

Of Highest Speed, Less Needle Breakage, Less Seconds, Largest Production.



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Steaming, pressing, drying and folding in one operation.

SLEEVERS. Two styles.

STRIPER FOR RIB GOODS.
24 feeds. Cut 14 to inch.

THE UNIVERSAL CLOTH TURNER
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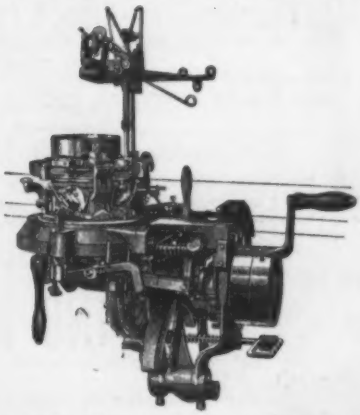

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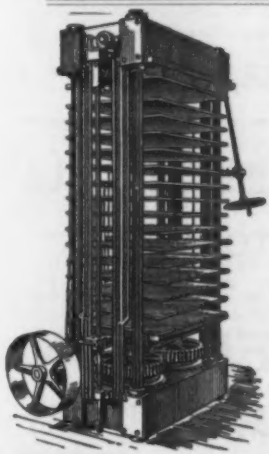

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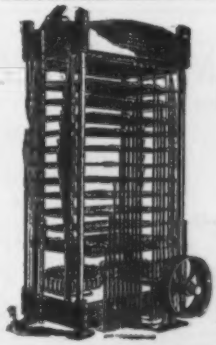

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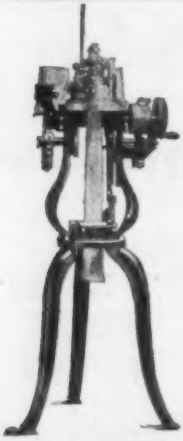

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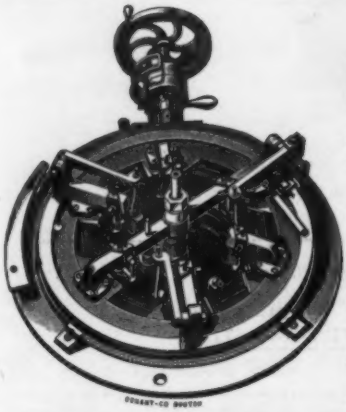

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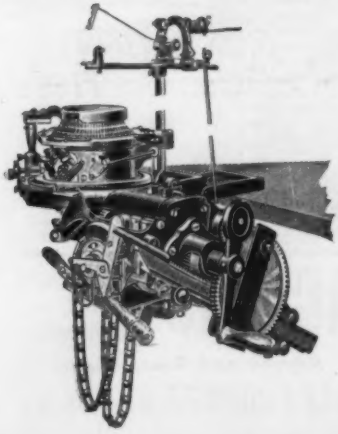

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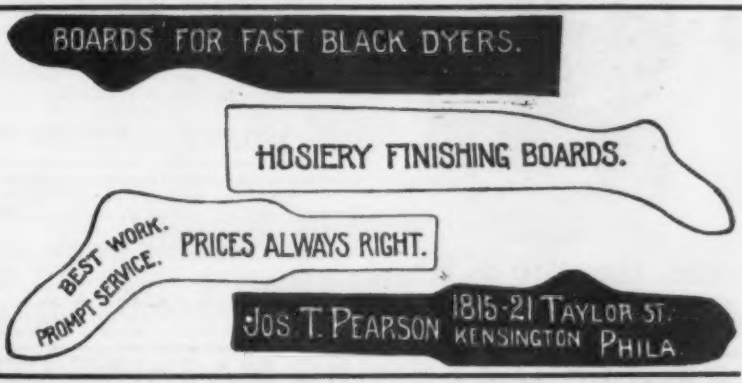

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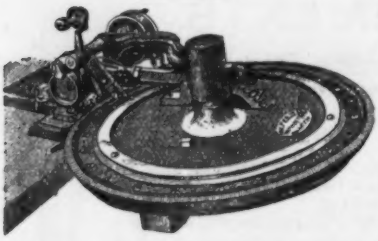

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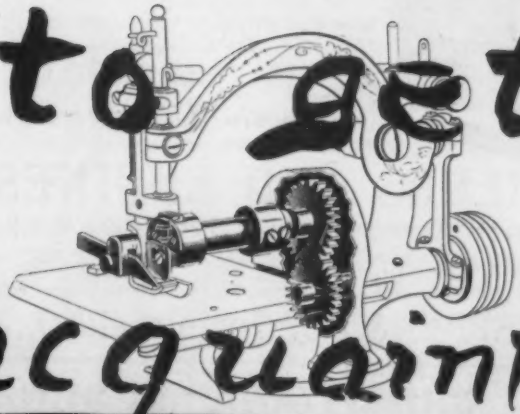
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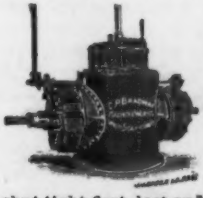

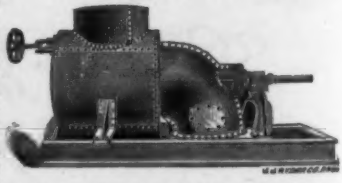

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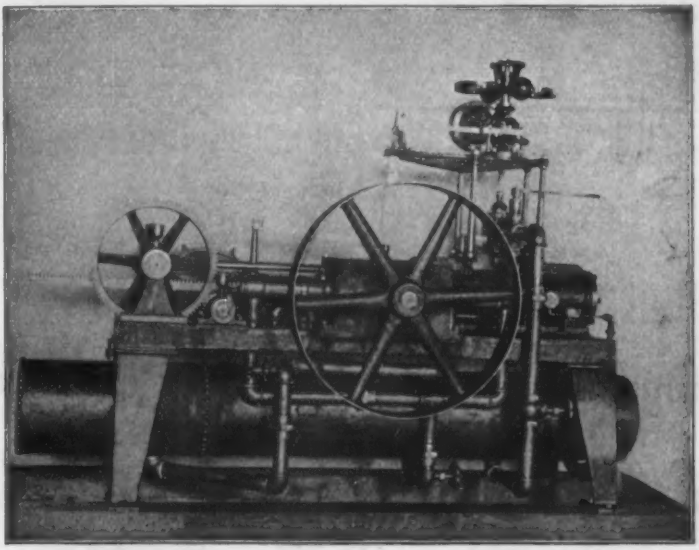

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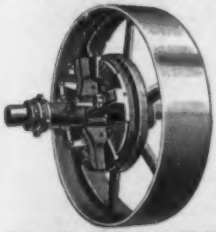

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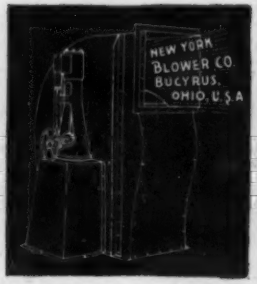

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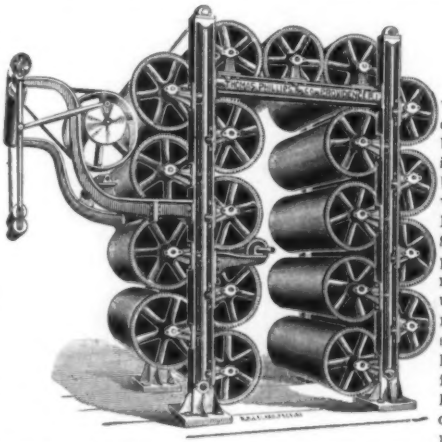
Drying and Finishing Machinery.



Phillips Upright Drying Machine.

The cut shows a 19-can machine with two tiers with intermediate can for continuous drying. We build any arrangement of stringing and furnish any desired number of cans, of any length, either with Phillips Steel Head or Cast Iron. We strongly advise our Steel Head Can. It is a big improvement as eight years' experience has demonstrated. This upright machine enables cloth to run without wide intermediate spaces between the tiers, as in horizontal machine, thus avoiding "scrimps." We also build Horizontal Frames, but on radically different principles from most others. Our illustrated catalogue explains all these points at length and has many plates showing different styles of stringing. It may be had for the asking.

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